

ARCHIVES OF OTOTOLOGY.

REPORT OF A CASE OF LEPTOMENINGITIS WITH ONSET OF SYMPTOMS, SIXTEEN DAYS AFTER A RADICAL OPERATION, THE INFECTION REACHING THE MENINGES ALONG THE FACIAL NERVE.¹

By CHARLES NELSON SPRATT, B.S., M.D., MINNEAPOLIS,
MINN.

Mr. C. B., forty-five years of age, came under my care, May 15, 1905. He gave the following history:

January, 1904, he had an acute left mastoiditis. Operation was advised at the time but was not allowed. The acute symptoms subsided under treatment. The otorrhœa, however, continued for about four months. Since then the hearing has been very poor and he has had at times a slight pain in the ear. Otherwise he has been in excellent health. About seven weeks ago he had otalgia, some vertigo, and the discharge reappeared. This was scanty and of foul odor. On May 13th he noticed that the left side of his face felt "stiff," and that the mouth was drawn to the opposite side.

Examination May 15, 1905, showed a moderate discharge from the left ear, thin in character, and of a foul odor. No antrum or tip tenderness elicited on pressure. The anterior, superior, and posterior walls of the membranous canal were red and so swollen as to prevent a view of the tympanic membrane. Patient had some headache at night. Temperature, 98.5°. Pulse, 72. There was present a partial paralysis of left side of face. Hot irrigations were ordered and the patient placed under observation.

¹Presented as Thesis for membership in the American Laryngological, Rhynological, and Otological Society.

Five days later the facial paralysis seemed to be less marked. The cedema of the canal had increased but there was no mastoid tenderness. The headache and the otorrhoea continued. Temperature, 98.6°. Pulse, 72. Operation was advised but was not consented to.

On May 24th, there had appeared during the night considerable cedema over the left side of the head, this was most marked over the root of zygoma and mastoid; the ear was displaced downward and forward. There was slight antrum and tip tenderness. Temperature, 99.5°. Pulse, 75.

On May 25th, under ether, the usual curved incision was made through the soft parts to the bone, and the upper angle was extended forward. Although the cortex appeared to be intact, it was rather soft. On removing this, three distinct foci of infection were found in the large pneumatic mastoid. The first of these involved the cells at the root of the zygoma. The second was a cavity containing thick, yellow pus and granulations, anterior to the descending limb of the sigmoid sinus. The third focus was in the mastoid tip. This cavity contained 2-3 c.cm. of thick pus. The bone along the facial ridge was soft and the cells contained pus and granulations. The diseased bone was thoroughly removed down to the inner table, which appeared to be solid and intact. Neither the sinus nor dura were exposed. The posterior bony canal wall was removed, and the tympanum was cleaned of granulations. The head of the malleus was apparently the only portion of the ossicles left. This was removed. A Körner flap was made and the large bony cavity was lined by Thiersch graft, these being held in place by gauze packing. The incision was closed.

With the exception of the night after the operation, he had no pain. Post operative temperature was at no time above 99.5°. All of the gauze packing was removed and he left the hospital May 31st. As the ear discharged a small amount of pus, it was dressed daily. He felt well and spent a portion of each day at his office, attending his law practice.

On June 10th (17th day after operation), he said that he had been restless the previous night. This, he thought, might be due to the fact that he had gone to bed rather late. Temperature, 99°. Pulse, 90. That afternoon he began to

have a severe headache. At 10 P.M. he had a distinct chill and his temperature was 102.4° . During the night the headache was severe, and when seen the next morning, June 11th, he appeared somewhat dazed and answered questions slowly. He had vomited, but this may have been due to a dose of castor oil, taken a short time previously. There was no tenderness over the head or neck. The pupils were small and there was no deviation. Knee jerks were not increased; no ankle clonus. Temperature, 101° . Pulse, 84. At noon he had a second chill and temperature reached 103° . Pulse, 90. Mental condition was worse. Fundi were examined and disk margins found to be sharp and distinct.

Operation, June 11th, under ether, the incision of the previous operation was reopened and the cavity was found to be lined by epithelium, except the portion corresponding to the mastoid tip. The inner table everywhere appeared sound and intact. The dura over cerebellum and temporo-sphenoidal lobe was exposed and presented no evidence of infection. The sinus wall was thin, soft, smooth, and dented on pressure. A small flap of dura was turned down from temporo-sphenoidal lobe. This was followed by some bulging of the brain substance. The vessels of the pia-arachnoid were injected but otherwise no signs of meningitis were made out. As the meninges showed only a slight injection and the brain appeared to be normal, in color and consistency, exploration of the brain was not thought advisable.

The patient slept well during night and his condition in the morning showed little change. Temperature, 102.5° . Pulse, 100. Later in the day he became unconscious, the neck was rigid, and there was twitching of fingers, the patellar reflexes were not increased. Kernig's sign was present. Paralysis of bladder required the use of the catheter. That afternoon the wound was dressed and a large flap of dura was turned back. The temporo-sphenoidal lobe was explored with a grooved director. A rather marked bulging of the brain followed the turning back of the dura flap and the pulse jumped from 99 to 154. Patient died that night.

Autopsy.—The dura was white and showed no evidence of infection. The auditory and facial nerves, at their

entrance into the internal auditory meatus, were surrounded by a mass of yellow purulent exudate. This process extended upward in the sulci of both sides of the convex surface to the longitudinal fissure. The sides and superior surface of the cerebellum showed the same condition. The outer surfaces of both temporo-sphenoidal lobes were practically free from exudate. The vessels of the pia were injected.

It was clear that the infection had spread from the internal auditory canal to the outer surface of the brain, and from there to the base. Here the exudate was very dense so that the nerves were matted together. The medulla, on its inferior surface, was also covered with exudate. The process had extended upward along the outer surface of the cerebellum and cerebrum, so that the sulci of every portion of the brain, except the outer surfaces of the temporo-sphenoidal lobes, were involved.

Sections examined showed the exudate to consist of fibrin and leucocytes, with new formation of blood vessels. The *Pneumococcus* was found in sections and cover slips. The brain was noteworthy on account of the size. After allowing the fluid to drain, the weight was 2060 gms. The average weight of the adult male brain is 1360 gms. The patient had been a very intelligent professional man.

This case presents several points that merit further notice:

First: The extensive mastoid involvement, with a comparatively slight amount of pain and mastoid tenderness. With a sclerosed and thickened cortex, bone tenderness is often slight or absent. In a chronic or subacute mastoiditis, as in a chronic osteomyelitis of any other bone, pain and other subjective symptoms are usually not present. It is in the acute and rapidly spreading processes that subjective symptoms are marked.

Second: The late onset of meningitis. The patient had felt well and had been attending to his regular work

for about a week. During this time the infection had gradually extended along the facial nerve to the pia-arachnoid, with a rapid and fatal termination on reaching the latter.

Third: The virulence of the infection and rapidity of the course of meningitis. The patient was dead 70 hours after the period of unrest and 50 hours after initial severe headache.

Fourth: The course of the infection is unusual. The most common path is directly from the mastoid to the dura. The writer has, however, seen a radical operation done for a recurrent mastoiditis, in which the dura and sinus were exposed. The patient made a rapid recovery, leaving the hospital on the 11th day. On the 14th day after operation she had a chill and sudden rise of temperature. She was operated on for sinus thrombosis, with a fatal termination. Other paths of infection are along the carotid canal, through the lymph channels in the bone or blood-vessels or through the labyrinth. In this case the dura mater was not involved.

Fifth: An important question is brought out by this case. Did the grafting of the cavity have anything to do with the extension of the infection? At the onset of the acute symptoms, this was an open question. The findings of the autopsy, however, showed conclusively that the infections had not entered the cranial cavity from the field of operation. This was shown by the normal dura about this region. The fact that a facial paralysis had existed for some time previous to the first operation and that at the operation the bone about the Fallopian canal was found to be diseased, shows the origin of the infection. The localization of the exudate about the internal auditory meatus; the period of apparent recovery, followed by the sudden onset of symptoms, sixteen days after operation; the healthy condition of the bone and dura about the field of operation, all

point in a very definite manner that the infection had reached the meninges by extension along the facial nerve, and that the grafting had absolutely nothing to do with the course of the disease. Had any of the dura or sinus been exposed at first operation, grafting would not have been done.

DIONIN IN CHRONIC CATARRHAL DEAFNESS.¹

By B. ALEX. RANDALL, M.A., M.D., PHILADELPHIA, PA.

THE treatment of chronic catarrhal deafness has always been one of the most difficult problems of the aurist and the limited success attained has always been held an opprobrium to the specialty. Within our own ranks many are hardly undertaking its treatment, holding too despairing a view as to its promise of results. Other lines assuredly offer more brilliant possibilities; yet the host of sufferers tending to increasing disability and distress because of the advance of this insidious disease fully demands persistent effort by the aurist for their relief. The recognition of the cases of spongy bone-formation in the labyrinth in otosclerosis ought not to be any discouragement to labor for the betterment of even these conditions; while it differentiates them the better from the commoner and more amenable cases, and should make the prognosis of the latter both clearer and more favorable.

New measures must be sought, of course, if improvement is to be secured; and while I have always protested against "running after new gods" to the desertion of those methods of known but limited worth which we have long possessed, it has been the duty of every conscientious man to test whatever holds out promise of benefit. I have, therefore, been employing for tympanic medication through the catheter various drugs which

¹Read in the Section on Otology and Laryngology, Phila. College of Physicians, Dec. 19, 1906.

have seemed likely to do more to reverse the unfavorable progress than iodide in its various forms. Thiosinamine and its equivalent fibrolysin have not given to me or most others the results promised by their advocates; but dionin, which has done good service in ophthalmology in absorbing plastic exudates, seems better to meet expectations. Little irritation is caused by even 5 per cent. solutions in the Eustachian tube and tympanum and the effect has usually excelled that of similar measures. Without reporting at this time any series of cases as substantiating its value, I desire to call attention to its possibilities and invite others to test its employment.

In selecting cases for the test, it is not necessary to exclude those showing some impairment of the nervous apparatus. In many this seems wholly secondary to the middle-ear hyperplasia and promptly to clear up with its improvement. Advanced cases with wide sclerotic Eustachian tubes give only the better opportunity to carry the medication into the tympanic cavities. Yet we must be cautious in both these types to avoid all vigor in the inflation, lest we concuss the nervous apparatus by the force employed. The method which I have long advocated can hardly be improved upon (Tr. Penna. State Medical Society, *University Medical Magazine*, July, 1896), of cleansing well the nose and naso-pharynx by diligent spray, mopping the tube-mouths clean with an astringent, and spraying the medicated solution up the catheter with a simple hand-ball atomizer. With the Politzer bag one can drive up a coarser spray by throwing a drop or two of the solution into the catheter with a medicine dropper.

Among the non-essentials which contribute distinctly to the ease and success of the procedure, I would note that I use a pure-silver catheter, which is easily given the exact curvature which will best suit the case in hand, sterilized by heating to a glow in the flame; and I always employ a valveless Politzer bag with a ball-top too

large to enter the funnel extremity of the catheter. Mere apposition then gives air-tight connection of bag and catheter, with "ball and socket" junction which allows much freedom of relative position and no jarring in placing or separating the two. Much of the paraphernalia often advised for catheter injection thus is rendered superfluous and the simplicity of the procedure renders gentleness and precision far easier. Employed in this or any way preferred by the aurist, I feel sure that the dionin will give some satisfactory results and trust that it will be tested by colleagues in cases resisting other methods.

A CASE OF MASTOIDITIS COMPLICATED BY
THROMBOSIS OF THE LEFT LATERAL PET-
ROSAL AND CAVERNOUS SINUSES. OPER-
ATION. REPORT OF AUTOPSY.

By ROBERT LEWIS, JR., M.D.

(With Temperature Chart on Text-Plate I.)

William Vingerwich, a laborer and a native of Poland, aet. 22 years, was admitted to the Flushing Hospital on October 29, 1906, at 3.30 P.M.

On admission the temperature was 98° F., the respirations were 24 and the pulse was 92. After examination the case was diagnosed as one of pneumonia. About 8.30 P.M. the patient had a chill lasting twenty minutes, followed by a rise of temperature to 103.8° F. October 30th, no chill, the temperature during the day ranged between 98.2° F. and 102.2° F., the respirations were about 32 and the pulse was about 132. October 31st, the patient had another chill, the range of temperature was between 104.4° F. and 98.4° F., the respirations were about 40, and the pulse was about 148. November 1st, the temperature ranged between 96° F. and 104° F., the respirations were about 40, and the pulse was about 128. On this date the attending physician noticed a marked mastoid tenderness and I was called to see him. I saw the case late in the afternoon and found that the tenderness was very pronounced over the entire mastoid, also tenderness, along the line of the internal jugular vein.

Because of the patient's inability to speak English and because of the lack of an interpreter, no history of his previous condition could be obtained. No discharge had been noticed coming from the external auditory canal, but upon examina-

tion I found a few drops of pus at the bottom of this canal. On an attempt being made to clean the external auditory canal the cotton-tipped carrier broke through the drum membrane, which was very thin, and gave vent to a thick, purulent, odorless discharge. The condition as here found, led me to suppose that I was dealing with an acute case. I ordered the patient prepared for the mastoid operation and also for the probable exsection of the internal jugular vein.

Operation. The mastoid cortex was very hard but after I had removed it I found that the remaining mastoid, including the greater portion of the inner table, had been destroyed. Occupying the formed cavity was a quantity of thick, mal-odorous pus. The sigmoid sinus was absolutely obliterated, not even a clot occupying the former situation of the sinus. All that was left of it were portions of the lateral wall of the vein along the dura. This condition extended from a little beyond the knee, almost to the bulb. I removed the bone about half the distance between the knee and the torcular, and then curetted the remaining portion of the sinus as far as the torcular; the flow of blood was only fairly pronounced. The hemorrhage was controlled and the wound was plugged and I then proceeded to remove the internal jugular vein. No clot was found in the vein, but a bacterial examination, later, showed a streptococcus infection of the vessel walls.

During the next five days I did not see the patient, the temperature for each day as shown by the accompanying chart, showed marked remissions between 99.4° F. and 105.2° F. On November 4th, the conjunctiva of the left eye was reported to me, as markedly swollen and congested, and I suspected an occlusion of the cavernous sinus. On Nov. 6th, I visited him. His condition was very bad and I felt that I would like to explore the sinus on the other (the right) side, beyond the torcular. I removed the remaining portion of the bone covering the left lateral sinus as far as the torcular and curetted the sinus on the opposite side. I found no clot but the flow of blood was not at all free. The patient died about one hour after being returned to the ward. As his condition on leaving the operating table was very fair I was at a loss to explain his sudden demise, and believed at the time that it was due to a dislodgment, while curetting, of a

portion of the thrombus in the right *sinus*, and the embolus thus loosened passed, by way of the right internal jugular vein, into the circulation and reaching the heart prevented one of the valves of the heart from properly closing.

Dr. Dixon, as a result of his autopsy, does not believe this supposition to be true. However, from my experience with this case, I think such an accident is very likely to occur, and I do not believe it to be good surgery to attempt a curettement of the lateral sinus from the opposite side by way of the torcular Herophili, without first preventing, by means of a ligature around the internal jugular vein, a dislodged portion of a thrombus from getting into the general circulation. I have failed to find in the literature any reference to such a possible contingency.

Following is the report of Dr. Dixon's autopsy.

W. V. died in the Flushing Hospital November 6, 1906. Autopsy, 2 P.M., November 7th.

The body was that of a fairly well nourished male, age estimated to be about twenty-six. The entire surface was deeply jaundiced, and the back of the neck was considerably swollen.

Evidence of an extensive mastoid operation was present on the left side. An operative wound was also present in the line of the left internal jugular vein. The wounds were packed with gauze.

When the skull-cap was removed the dura was seen to be rather hyperæmic, but not markedly so. Division of the dura revealed a mild sero-purulent leptomeningitis over the vertex of both hemispheres. The brain was otherwise normal.

A small parietal clot (white) was found in the right lateral sinus near the knee. A purulent thrombus was present in the left inferior petrosal and cavernous sinuses, more advanced in the latter. All the small veins collateral to the left lateral sinus were thrombosed,—evidently the result of obliteration of the sinus.

The body of the sphenoid was discolored and the left sphenoidal cell was filled with a muco-purulent material. The ethmoidal cells were of normal appearance. No pus was found in the left orbit.

The right internal jugular vein was examined and found normal.

When the chest was opened the pericardial sac was found distended. It contained not less than six ounces of fluid of a clear amber color. The heart was soft and flabby to the touch.

A large firm thrombus was found in the right auricle which extended through the auriculo-ventricular opening into the ventricle where it was attached to the columnæ carneæ. A considerable portion of the auricular end of the thrombus, and all of the ventricular end, was dense and white. That portion attached to the auricular wall was thick and had evidently been present for a considerable length of time, but the balance of the auricular cavity was filled with a recent red clot sufficiently large to account for the fact that the ventricles were empty.

There was also a dense white thrombus in the left auricle which extended into the left ventricle, curved upward, and ended in tongue-like form near the aortic valves.

The right lung was somewhat œdematous, but the pleural cavity contained no fluid. The left pleural cavity contained a large quantity of purulent, foul-smelling fluid,—certainly not less than three pints; no means for accurately measuring it were at hand. Dense adhesions were encountered over the lower posterior portion of the lower lobe, and an abscess cavity, measuring 3 x 4.5 cm, was found in the lung at this point. The upper lobe was in a condition of red hepatization, and small abscess cavities were scattered through it. No tuberculous nodules could be found.

The stomach and intestines were distended with gas.

The liver was enlarged, and seemed to be rather soft and friable. No abscess was present. The gall bladder was distended.

The balance of the viscera was not disturbed.

Smears were taken from the abscess cavities of the lung and from the purulent thrombus in the left cavernous sinus.

The preparations all showed enormous numbers of micro-organisms, many probably putrefactive, but the one from the cavernous sinus showed in addition what appeared to be the spirillum of Vincent. No tubercle bacilli could be found.

The immediate cause of death was cardiac thrombosis.¹

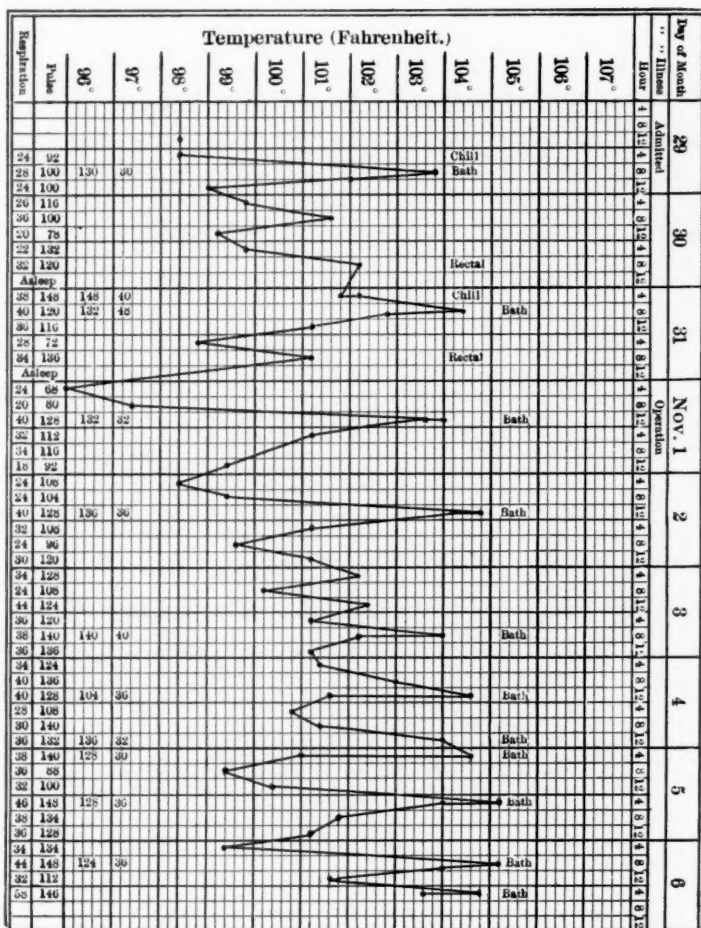
Very respectfully,

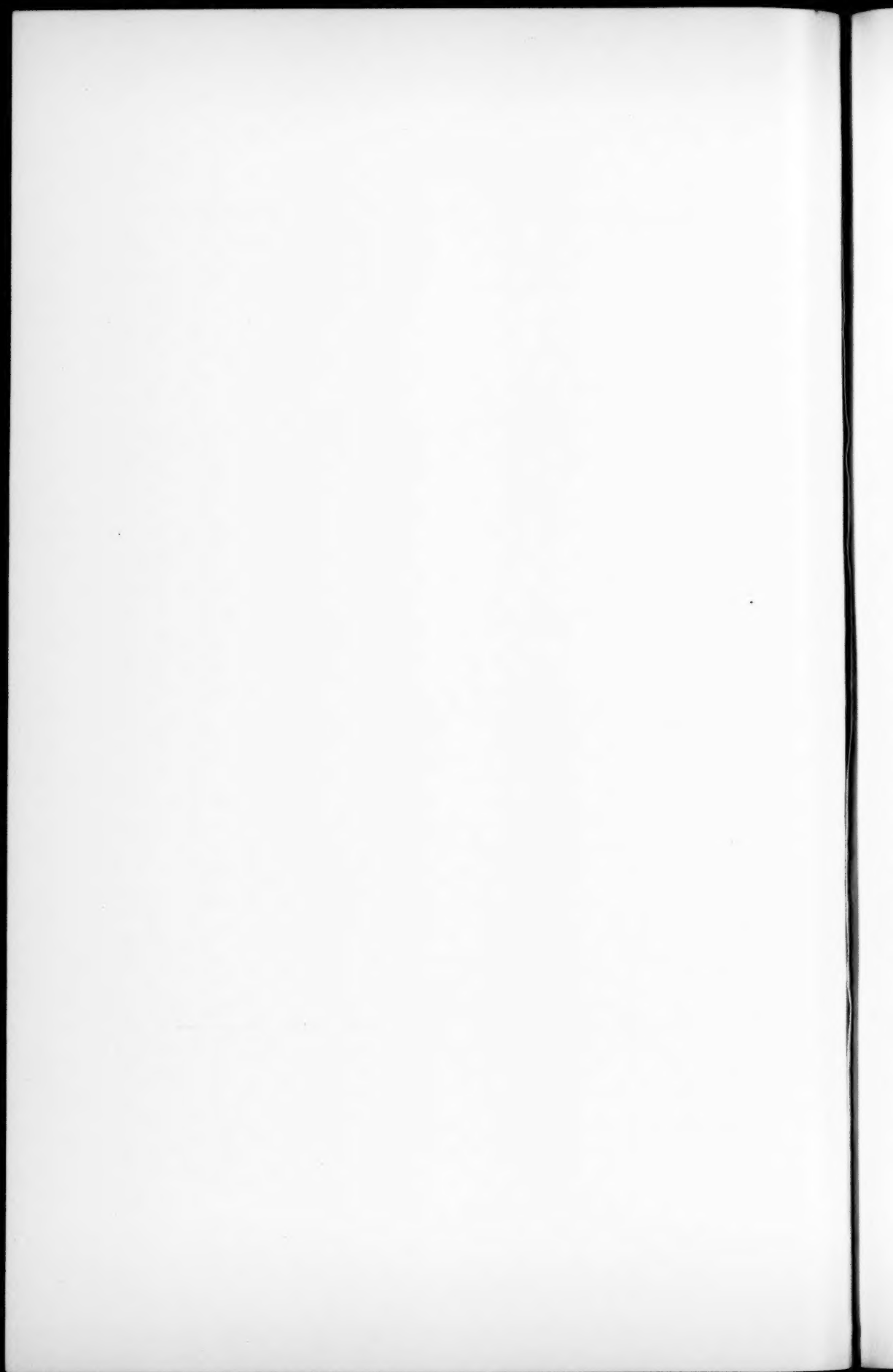
GEO. S. DIXON.

November 7, 1906.

¹ I do not think it at all likely that a detachment of a thrombus in this case had anything to do with death. Etherization may have hastened matters somewhat and increased the size of the clot in the right auricle, for it was full when opened, and the greater bulk of the clot was recent.

G. S. DIXON.





MASTOIDITIS OCCURRING IN DIABETIC SUBJECTS, WITH REPORT OF CASES.¹

By JOHN D. RICHARDS, M.D., OF NEW YORK.

IN the following report the writer refers to mastoiditis occurring in only those patients who in addition to having sugar in the urine (not transient) present the well marked general symptoms and the clinical picture of diabetes mellitus.

Those cases of mastoiditis with transient glycosuria; or with glycosuria which follows the anæsthesia but was not noticed previous to the operation; or glycosuria in the young, without the clinical symptoms of diabetes proper being present, are not referred to in this paper.

The report of such cases as cases of mastoiditis complicating diabetes is erroneous and inaccurate, and statistics so based are altogether misleading, in that they give a false sense of security in one of the gravest, one of the most fatal conditions with which the aural surgeon has to deal. The percentage of recoveries in this latter class of cases is, of course, very high. The percentage of recoveries in the first class is exceedingly low.

CASE I. Male, aged fifty-eight. The known duration of the diabetes mellitus was three years.

On July 1, 1905, he had acute pain in the left ear. This continued with varying intensity until July 16th, when there was a sharp hemorrhage from the aural canal. On the following day there was a profuse discharge of creamy pus.

¹ Read in part before the Section on Otology, N. Y. Academy of Medicine, Dec. 13, 1906.

On July 20th, on account of pain, he consulted his physician. About this time the family noticed that the patient forgot the names of ordinary objects about the room.

On August 1st, patient was seen in the ear department of Vanderbilt Clinic, and I learn that he complained then of violent pain in the left ear, and that the mind was somewhat hazy, this being attributed to the violent pain from which he states he had suffered for about two weeks.

Examination of the ear shows bulging membrana tympani, sagging of the postero-superior canal wall, and marked general mastoid tenderness. Incision of the drum was made, and in a few days the marked tenderness had abated. Three days later, Aug. 4th, pain recurred. A second, and later, a third incision of the membrana tympani was made. A profuse discharge of pus was now issuing from the canal. The patient expressed himself as feeling well. On Aug. 16th he appeared again at the clinic, and at this visit decided aphasia was noticed.

On Aug. 21, 1905, fifty-one days after the initial earache, I first saw him and an examination revealed the following condition:

He was a large plethoric man of middle age. He suffered from slight dyspnoea, and preferred a semi-recumbent position. The odor of acetone could be detected on the breath. The skin and lips were dry; the tongue, which was large and flabby, was tremulous, abnormally red, and deeply fissured. Heart and lungs negative.

Ear Examination. Aural canal was filled with creamy pus to which distinct pulsation was imparted. There was marked bulging of the membrana tympani, and sagging of posterior and superior cartilaginous canal walls. There was general mastoid tenderness and oedema. The swelling of the scalp tissues extended well back toward the occiput.

Mental Examination. His mental condition, though interesting, was somewhat difficult to estimate. He appeared to take little interest in the conversation of those around him. He would occasionally, however, interrupt the conversation with a yes or no, or a nod of the head, as if to contradict or confirm certain statements. His interruptions were always apropos, and he appeared to have a clear conception of

what was said. His attention, for the most part, was concerned in an attempt to express his desire for water. He would do this by saying—"Give me," and then being unable to recall the word "water" would point to the pitcher. When asked if it was a chair that he wished, he would shake his head, showing that if a wrong name was given the object he appreciated the error. If asked if it was water that he wanted, he would nod yes,—showing that he recognized the correct association of the object with its proper name, when the name was mentioned. He could not recall his own name, and when asked to write it was unable to do so,—in fact he could not form his letters, and the attempt was mere scribbling. When his name was told him, he recognized it as correct. If then asked what his name was, he would say, "sure." All objects shown him were called "yes," "no," or "sure." This group of words seemed dominant. At times he would utilize another group of words with which to answer all questions and by which to call all objects. As a rule, however, he stuck to the "yes," and "no," and "sure" group. When shown a 25 cent piece and asked its name, he said "sure"; when asked if it was 15 cents, he shook his head; when asked if it was a quarter, he nodded "yes." When asked again what it was, he said "sure." On placing a knife in his hand, the eyes being closed, and being asked what it was he would say, "sure." The same result was obtained when a bunch of keys was rattled by his good ear. He quickly became fatigued mentally and would not answer, appearing not to have heard the question; if the interrogation were persisted in, his answer would be "sure," "yes," or "no," although the answers were altogether irrelevant to the questions asked.

Eye Examination. The left pupil, corresponding to the diseased side, was dilated and considerably larger than its fellow; neither pupil responded quickly to either light or accommodation. The fundus of each eye was negative.

Reflexes. The reflexes generally were good. There was a slightly exaggerated right patellar reflex. Station was excellent. The gait was steady. There were no areas of anæsthesia. The grip of each hand was poor, and about equal in both.

Urine. The quantity of urine passed in 24 hours was not known. From the son's statement I gathered that it was much in excess of the normal quantity. The examination showed 5 per cent. sugar. Acetone and diacetic acid were not examined for, though the odor of acetone was easily detected on the breath.

Prognosis to family. In spite of an unfavorable prognosis, the family desired an operation.

Operation. Chloroform anæsthesia. Upon opening the mastoid process there was a profuse gush of pus constituting an epidural abscess under high pressure. The interior of the mastoid was thoroughly disintegrated and filled with a mass of pus and granulations. The entire vertical sinus groove had been eroded. The sinus was covered with large black, disintegrating granulations. The dura above the tegmen antri and tympani was similarly involved. A Schwartze-Stacke operation was done. Just anterior to the knee of the sigmoid sinus the dura over the temporo-sphenoidal lobe showed an area of ulceration, the size of the thumb nail. This area was surrounded by fungus granulations. This appeared to be evidence of long-continued high pressure, and I thought at the time that it might have some possible bearing upon the aphasia, as on several occasions I had seen aphasia result from epidural abscess. The mastoid emissary vein was thrombosed throughout its course in the bone and for some distance into the tissues of the scalp (mixed infection). The vertical limb of the sigmoid was occupied by a thrombus, and the external wall of the vessel was exsected throughout the thrombosed area, when free return flow spontaneously occurred from both the torcular and the bulb end of the sinus.

Upon the suggestion of the attending neurologist, the temporo-sphenoidal lobe was explored systematically with a long thin-bladed knife, with negative results. Patient returned from operation in good condition. Later he was noisy, and constantly clamoring for water—saying, "give me," not being able to recall the word *water*.

On August 22d, the day following operation, his general condition was about the same as immediately before operation, and in attempting to ask for water he would say, "give

me," and then point to the pitcher. He was quiet throughout the day. He received large doses of codeine.

On August 23d, he was somewhat drowsy and showed a tendency to sleep. He could be easily awakened, but would not speak. The only time he appeared to understand me was when I asked him to squeeze my hand, which he did. At 12 noon he had a slight convulsion. This began with twitching of the right side of the face—the side opposite operation. The eyes were directed up and to the left. There was slight cyanosis. The duration of this attack was two minutes. 12.20. Twenty minutes later he had a second convulsion which began at the angle of the mouth, extended over the entire right side of the face, then involved the right arm, the movements commencing first in the fingers. The head was turned to the right side; the eyes were directed up and to the left; the left arm and leg were perfectly flaccid and the tongue quiet. There was marked cyanosis in the attack which lasted two minutes, during which time he was unconscious. At 3 P.M. he had a similar convulsion in which both arms and both hands twitched. The fundus of the left eye showed haziness. The amount of sugar in the urine has increased to 7 per cent. He takes nourishment, and drinks all the water that is given him.

August 24th. Condition was similar to that of the previous day. At times he appeared somewhat better and understood what was said to him. He was still unable to speak. The right elbow and sacrum showed areas of beginning pressure necrosis. The mastoid wound looked dead.

August 25th. Patient is restless and semi-comatose; voided urine involuntarily. Temperature which has been low, has risen to 102°; pulse 102. Sacrum and elbow show large pressure ulcers.

August 26th. Patient passed into deep coma and died. A specimen of cerebro spinal fluid taken two days before death showed streptococci.

Autopsy, Laboratory. N. Y. Eye and Ear Infirmary. Upon removing the calvarium a considerable quantity of clear fluid escaped. This was extradural. When the dura was removed, a thin clot was found over the left parietal lobe

which had ascended from a subcortical hemorrhage represented by a clot about three-quarters of an inch in diameter. This hemorrhage was evidently of some weeks' standing. The subarachnoid space was filled with a slightly cloudy fluid in considerable quantity. Immediately behind the fissure of Rolando, near the superior longitudinal fissure, there was considerable thickening and there appeared to be a greater collection of fluid here than elsewhere. (This may have had some bearing upon the convulsions.) The remaining portion of the left lateral sinus was thrombosed to the torcular. The thrombus was continued into the right lateral sinus to about two-thirds of its length—a short distance into the straight, but not into the superior. The left superior petrosal was thrombosed, as were also many of the collateral veins in the vicinity. The right petrosal sinuses were empty. (This thrombosis evidently resulted after the operative procedure.) Smears from the subarachnoid fluid showed cocci singly and in pairs.

Cause of Death. Diabetes mellitus; meningitis; general sinus thrombosis, and subcortical cerebral hemorrhage.

A point of particular interest in this case is the cause of the aphasia, inasmuch as there were several factors which may have been responsible for it. The case illustrates the difficulty of attaching the proper clinical importance, from a surgical standpoint, to this symptom, and the danger of assuming that the temporo-sphenoidal lobe is the necessary seat of the disturbing lesion.

1st. The diabetic condition in itself may have been responsible for the aphasia. Against its being so, is the fact that though the patient had been known to have had diabetes for three years, and had been during a portion of the time under the ablest medical supervision, the aphasia was not noted until after the onset of the ear disease.

2d. Epidural abscess. This condition alone occasionally produces an aphasia, a dilated pupil of the corresponding side to the lesion, or an optic papillitis. I have in

several cases seen aphasia result from epidural abscess. The presence in this particular case of an area of ulceration of the temporo-sphenoidal dura, significant of long-continued high pressure, would rather point to the correctness of the supposition than otherwise, had not there been found at the autopsy an altogether independent lesion (the cerebral hemorrhage) to which with more probability the aphasia could be attributed.

3d. Meningitis. This condition is also a cause of aphasia, and was present in this case. It is highly probable, however, that the meningitis had no bearing upon the aphasia, for the aphasia was noted about thirty-four days prior to the patient's death. Had purulent meningitis been the cause, death would probably have resulted earlier, and a more definite clinical picture of meningitis would have developed during this long period.

4th. The postmortem appearance and the size of the subcortical cerebro-hemorrhage made it the most probable factor responsible in the aphasia.

5th. Considering the nature of the case (a suppurative ear disease, with symptoms pointing to intracranial involvement) the diagnosis based upon the percentage of probabilities could scarcely have been other than temporo-sphenoidal abscess, particularly in view of the fact that the aphasia was rendered more important as a localizing symptom when taken in conjunction with the agraphia which was present. This combination pointed not only to the temporo-sphenoidal lobe as the seat of the lesion, but that the lesion was sufficiently deep to involve certain motor tracts.

The various points in regard to the aphasia in this case I have mentioned simply to show how difficult it is to attach the proper surgical importance to a symptom which is regarded too highly as a localizing symptom. No doubt the function of the temporo-sphenoidal lobe is interfered with when we get certain forms of aphasia,

but this does not necessarily mean that the temporo-sphenoidal lobe is itself the seat of the lesion. The causative factor may be in an adjacent lobe, causing aphasia by transmitted pressure; it may be totally extra-dural, as in epidural abscess; or it may be due to a general disease having no particular connection whatever with the cranial cavity.

CASE 2. Operated upon at St. Mark's Hospital, December 1, 1905. Plethoric male, aged fifty-one. The duration of the diabetes is indefinite, as the general symptoms were not of such severity as to have attracted the patient's attention seriously to himself. During the past year he has failed somewhat in strength and weight, and, though not to any considerable degree, he has noticed that he becomes easily fatigued. He suffers from thirst and drinks a large amount of water during the day, and considerable beer. He has been in the habit of arising several times in the night to pass urine, and during the day voids urine frequently. Pruritis has troubled him from time to time.

About five weeks prior to his admission to the hospital he contracted a severe cold in the head. Several days later the ear became stuffy and the seat of intermittent pain, which was not severe, and which soon subsided spontaneously. He noticed at this time a marked loss of hearing. About ten days after the onset of the ear symptoms there was a slight discharge of pus from the ear. This, together with the diminution in hearing, has continued to the present time.

During the past week he has suffered at night with dull pain in and around the ear, and headache of moderate severity. The aural discharge has increased in quantity, otherwise he feels well. There have been no sweats, and if any fever, not sufficient to have attracted his attention. Heart and lungs are negative; pulse and temperature normal. The urine contains 3 per cent. sugar. Specific gravity, 1.028. No albumin. Diacetic acid and acetone were not examined for.

Present Examination. The auditory meatus is filled with creamy pus. There is marked bulging of the membrana tympani which has been bellied out into the auditory canal by excessive pressure from within; through a perforation of

the postero-inferior quadrant of the drum, pus issues with pulsation and rapidly fills the depth of the canal. Upon being wiped away, there is drooping of the superior canal-wall and marked constriction of the fundus. Mastoid antrum and tip tenderness are both well marked. The point of greatest tenderness—which is exquisite—is along the postero-inferior border of the mastoid. There is no cedema in this region.

The disproportion between the amount of elicitable pain on pressure (the tenderness) which is exquisite—and the absence of pain when no pressure is made, is striking. This patient had received no treatment for his general condition prior to the operation, nor had he been on a suitable diet.

Operation. Mastoid cortex negative. Upon removing groove from base to tip, thin, yellow, non-odorous pus issues from the interior of the mastoid in sufficient quantity to flow over the bone—to this pulsation is imparted. The interior of the mastoid is absolutely disintegrated, and the bone is represented by a mere shell filled with a broken down mass of granulation and pus. The tip of the mastoid is necrotic and mushy. The vertical limb of the sinus and the adjacent cerebellar dura are bare of their super-imposed bony plate and invested by large black granulations which form the base of the epidural abscess. There is a slight erosion of the tegmen antri posteriorly, with exposure of dura. The cells encased in the posterior zygomatic arch are extensively invaded, and the aditus blocked by a mulberry mass of granulations. Both the tegmen antri and the remaining portion of the visceral plate covering the anterior face of the cerebellar dura as far forward as the posterior semicircular canal, were removed, so that the entire base of the cavity was formed by dura. Plain gauze was used for packing throughout. The further healing of this case was uneventful, and essentially that of an ordinary mastoid wound, with the tendency of the granulations to more than usual exuberance. The urinary examination up to the time of the patient's discharge remains the same. He was receiving codeine in large doses, but his station was such that the restriction of his diet to proper articles of food was practically impossible.

CASE 3. Male, aged seventy years. Three years ago the patient suffered from marked general fatigue, cramps in the legs, excessive thirst, and increased amount of urine, the sticky quality of which caused him to consult a physician who detected the diabetic condition. After a year of strict diet and medication (which from the patient's statement I take to be codeine given in increasing doses) the sugar disappeared. No further examination of the urine was then made until the present ear trouble, which dates from March 25, 1906.

On March 22, 1906, patient had a cold in the head accompanied by a marked general depression, and that combination of symptoms which it has become customary to report as grippe. In three days there was acute pain in the left ear. The membrana tympani was red and bulging; temperature, 99° and a fraction. The drum membrane was incised and a profuse discharge of pus followed. Owing to continued bulging of the drum three subsequent incisions were made, and though there was no mastoid tenderness during this time, the ear was discharging profusely. The patient was put upon strict diet and increasing doses of codeine. The urine in twenty-four hours amounts to three quarts, and over 3 per cent. of sugar was present. There was neither albumin nor casts; no diacetic acid or acetone.

The profuse discharge continued; the lumen of the cartilaginous canal became gradually narrowed by sagging of the superior and prolapse of the posterior walls, and about April 20th, mastoid antrum and tip tenderness were noted—neither was marked. Several days later, post-mastoid tenderness and oedema developed, and slight headache, referred to a point above and behind the base of the mastoid, occurred. The temperature up to this time had not risen above 99.6° F.

He had a double aortic murmur and a mitral regurgitation.

I am indebted to Dr. B. F. Knause for this history.

On April 27th (the day of operation, when I first saw the patient), the condition was the same as that of the 26th. From the records of the New York Eye and Ear Infirmary the following notes on the operation are taken.

The mastoid cortex is discolored. The tip of the mastoid is perforated posteriorly, and through the perforation pus

issues with pulsation. Pus escapes from the tissues of the neck. (The tip in this case had broken down and disintegrated, and the tissues in the upper portion of the neck formed the base of a large abscess cavity). The sinus was exposed the full length of the mastoid wound (the inner plate had been eroded by the disease). The dura was exposed from the zygoma to a point an inch behind the sinus knee. Plain gauze dressings.

The further history of the case is uneventful, and is that of an ordinary mastoid wound. For the first ten days the wound showed the usual post operative appearance seen in these diabetic cases.

CASE 4. Male, aged forty-six years. Duration of diabetes unknown. Patient has suffered for about a year from loss of weight and strength, pruritis, excessive thirst, the recurrence of crops of boils, and the passing of large quantities of urine.

During the latter part of June, 1906, he was seen by Dr. B. F. Knause of Brooklyn, who incised a furuncle of the left ear. This condition led to an immediate examination of the urine which revealed the diabetic condition. The swelling of the cartilaginous canal was such that the fundus of the ear could not be seen on account of a diffuse external otitis. There was no aural discharge and the canal was packed. The mastoid was not tender. The temperature was a fraction of a degree above normal. The patient was passing five quarts of urine in the twenty-four hours, which showed a specific gravity of 1.030, sugar 10 per cent., and diacetic acid and acetone present. He was put upon strict diet and increasing doses of codeine.

After several days' packing a view was obtained of the fundus of the canal, and it was seen that the drum membrane participated in the general redness, but that there was no bulging present. This appearance of a diffuse external otitis without indication of mastoid involvement continued for about two weeks the temperature occasionally rising during this time to 99° plus, F.

On July 15th, there was questionable mastoid tenderness, which in the absence of any bulging of the drum was thought

to be possibly due to the furuncular condition. He continued the same until July 26th, when an examination revealed the following condition. On the posterior wall of the cartilaginous canal there is a furuncle from which may be pressed a small amount of creamy pus. The superior canal wall at this point is sagging and reddened; the anterior wall swollen, and the lumen of the canal so constricted as to prevent a thorough examination of the fundus. The membrana tympani, however, is seen to be reddened. The question of bulging is doubtful. External to the drum in the deep portion of the canal there is a small amount of desquamated epithelium; also a little pus, which in the absence of any demonstrable perforation in the drum is taken to have drained down from the furuncle. The general appearance of the canal is that of a diffuse external otitis supervening upon a furuncle.

Firm pressure over the mastoid antrum elicits questionable tenderness; tip tenderness is obscure. Over the posterior inferior border of the mastoid tenderness is positive and there is slight oedema. The patient complains of headache of moderate severity, which he refers to a point a little above and behind the base of the mastoid process.

Temperature is normal; pulse 88 per minute—increasing upon slight exertion to 116. Eye grounds are normal. He complains of general itching of the skin. There is a moderate sized boil upon the left forearm.

He is passing at this time five quarts of urine daily. The examination by Dr. Edwin G. Zabriskie (Laboratory of the Manhattan Eye and Ear Hospital) shows specific gravity 1.030; trace of albumin, sugar 10 per cent., diacetic acid and acetone present.

Operation. Chloroform anæsthesia. As the conditions pointed to extensive posterior involvement, with epidural abscess, and the element of time being of such importance, large posterior scalp flaps were made and the mastoid emissary sacrificed. This vessel did not bleed from its canal in the skull, which suggested the presence of sinus involvement. The mastoid cortex was not discolored. A wide groove was made in the bone from base to tip, and an ounce or thereabouts of thin fluid non-odorous pus issued with pulsation. The entire mastoid cortex was quickly removed with broad

nosed rongeurs and the interior of the bone was found to be disintegrated. The vertical sinus limb, and that portion of cerebellar dura as far internal as the posterior semicircular canal, were exposed by the disintegration process, and formed the base of an epidural abscess. The dura of the sinus limb was smooth and free of granulations. It reflected the image of the light held for illumination as if the vessel was covered by a thin layer of liquid. It was a dark slate color, as seen through a faint white film; it appeared gangrenous. The vessel was flattened unevenly, and a distinct thrombus could be felt in its lower portion. In the absence of symptoms pointing to septic absorption, and in view of the post mortem findings after operative interference in Case 1, this thrombus was treated as a non-infective clot due to vascular changes incident to diabetes, and it was not disturbed at the time of operation in order that the operation might be more quickly terminated.

The sinus groove was removed well down into its horizontal position, when healthy bone was reached. The cells immediately below the posterior semicircular canal leading inward toward the jugular bulb were extensively broken down and the bulb was exposed. The tegmen antri was necrotic and was removed. The pneumatic structure in the solid angle of the semicircular canal had been broken down so as to leave the whole series of arches well exposed to view. The inner plates of the mastoid were removed so that the base of the cavity was represented throughout by dura. The area of diseased dura extended posteriorly from the middle of the vertical sinus limb over the lateral aspect of the cerebellum.

On the second day following operation the wound on account of its fecal odor had to be dressed. The posterior incisions had sealed, though firm union did not exist. The dura of the vertical sinus limb was necrotic, moist, and sloughing. The wound showed no vitality, and in the depth of the cavity there was a thin slate-colored fluid of fecal odor. With scissors the gangrenous external sinus wall was removed, together with that portion of the thrombus corresponding, but no attempt was made to establish return flow from either the torcular or bulb ends of the vessel. Plain gauze was used for dressing, iodoform gauze being abandoned

on account of the possible renal irritation. Daily dressings were thereafter made and on August 8th the wound had lost its fecal odor. There was some sloughing of the upper ends of the mastoid muscle fibres in the lower angle of the wound. A few granulations were springing from portions of the bone. The dura of both cerebellum and sinus had cleared itself, and though there were no granulations over this area it had assumed a healthy whitish blue appearance, significant of beginning repair.

There is marked pulsation of the whole exposed area of dura which formed the bottom of the cavity. A small boil is present in the extreme posterior end of the horizontal incision. Patient feels sufficiently well to be up and about. Urine has decreased in the twenty-four hours to forty-three ounces; sugar 10 per cent.; acetone and diacetic acid are still present, with a trace of albumin. The later history of the wound was that of an uneventful healing.

The urinary examination at the present time, February 26, 1907, by Dr. Edwin G. Zabriskie (Laboratory of the Manhattan Eye and Ear Hospital). Amount in twenty-four hours, 5 quarts, 4 ounces. Specific gravity, 1.026. Sugar, 10 per cent. Albumin $\frac{1}{2}$ gram to the litre. Granular and hyaline casts present. Acetone present.

In addition to the four cases operated upon by the writer, he has seen five others—the operations and the subsequent results. If from this limited number correct conclusions may be drawn, he has been impressed with the following:

1st. That the mastoid invasion is somewhat characteristic. There is an acute otitis which may be—and frequently is not—accompanied by pain; a persistently bulging drum membrane which does not subside upon incision, or repeated incision; a gradual narrowing of the cartilaginous canal, through sagging of its walls or through thickening due to an associated external otitis. An external otitis may initiate the aural condition; mastoid antrum and tip tenderness, which develop late—or, if early, are but slight and variable; low temperature

and the absence in the mastoid region of acute inflammatory phenomena, indicating a poor fight on the part of the tissues; later, post-mastoid tenderness and œdema develop, which, with headache, localized at a point slightly above and behind the base of the mastoid indicate extensive destruction of the bone and epidural abscess—this is the course which many of the cases have run.

2d. The slow march of the mastoid symptoms and the absence of marked inflammatory phenomena (until late) argues not so much a virulence of infection in certain cases with extensive destruction as a low vitality of tissue. The post operative condition of the wounds also points to this; and the interior of the mastoid at the time of operation as a rule furnishes further proof in the presence of large, pale, flabby granulations. Were the infection virulent these granulations, which are of low vitality, would not attain to such size before being disintegrated. Their size is evidence of non-virulence.

3d. The good effect of a proper diet, and the administration of codeine in increasing doses was striking in two of the cases that recovered.

4th. The mortality in these cases is high. Six of the nine cases died. Death occurs, as a rule, within the first few days following operation, in diabetic coma.

5th. Anæsthetic. Of the three cases that recovered two were given chloroform, one ether (ether was administered in this case owing to the presence of a double aortic and a mitral regurgitant murmur). One of the chloroform cases passed into collapse and narrowly escaped death during the primary stage of the anæsthesia. (This was the patient whose urine amounted in the twenty-four hours to five quarts, with 10 per cent. sugar and both diacetic acid and acetone present.)

Of the six cases that died, four were given ether and two chloroform. One of these patients passed into diabetic coma during the administration of the anæsthetic, from which the patient did not emerge—in this

instance ether was given. In plethoric adults of advanced years I believe chloroform to be the safer anæsthetic.

6th. Following the administration of either chloroform or ether, there may be an increase, a decrease, or a temporary disappearance of the sugar in the urine.

7th. Following anæsthesia, dyspnœa may develop. It more commonly occurs in the cases to which ether is administered, and is of particular ill omen.

8th. A successful issue depends largely upon the rapidity of operation and the short duration of the anæsthesia. That it does not necessarily depend, however, upon early operation is shown by the three successful cases of the writer, in each of which the ear involvement was of one month's duration or more—in all of which there was extensive destruction with epidural abscess; and in one, there was in addition, a thrombosis of the sigmoid sinus. I do not, however, advocate delay in operative interference.

Rapidity of operation cannot be over-estimated. I have seen no case recover in which the operation lasted thirty minutes.

9th. The bone should be removed well beyond the apparent limit of involvement and a very thorough operation done, as the tissues are suffering from a dyscrasia and are more extensively involved than is indicated to the eye. It is safer in those cases where there is extensive destruction of the interior of the mastoid down to or through the dural plates, to remove these visceral plates entirely, so that the base of the wound is formed altogether of dura, and I advocate this procedure in this class of cases for the following reasons:

(a) By removing the interior of the mastoid or through its destruction by the disease the nutrition of the visceral plates is seriously interfered with, and particularly where a dyscrasia is present are they likely to suffer. This is shown first by the frequency with which the dural plates are broken down and destroyed in the diabetic cases,

and the rapidity with which this occurs; and second, by the poor character of the granulations which spring from them if they are allowed to remain. Granulations springing from such a bone pit are large, exuberant, flabby, and frequently incapable of organization, indicating a depraved base. In examining the bottom of these cavities we not infrequently find portions of the visceral plates which remain dead,—throw out no granulations,—and which we failed at the time of operation to detect as dead—owing to the deceptive appearance of thin hard bone.

(b) We remove in the most effective way all bone that may be devitalized beyond its ability to repair, and avoid therefore the chances of an unhealed wound which will of itself prove a drain upon an already debilitated patient; and we decrease the likelihood of a secondary operation which will of itself almost certainly prove fatal.

(c) Time is saved by this procedure—by exposing the dura at a given point sufficiently for the insertion of one blade of a rongeur between it and its overlying plate, we can separate the two and remove with the utmost rapidity the dural plate and its superimposed bony structure with the rongeur. In fifteen minutes total exenteration with removal of the visceral plates may be accomplished.

(d) The danger resulting from the exposure of dura is practically nil as compared with the advantages gained by this procedure. In addition, we secure the best possible base from which granulations may spring. The bulging of dura into the wound lessens its depth and shortens healing, and the pulsation of the brain when large areas of dura are exposed furthers drainage to a considerable degree.

It is bad surgery to sew up in these cases, even to the slightest extent, the soft tissue over bone pockets—as, for instance, the upper angle of the wound over the posterior root of a zygoma which has been excavated. It

is best to expose the dura and obliterate the dead space by allowing the soft tissues to sink in and meet it, and it is just here that the pulsation of dura is of great advantage in securing drainage. If the bone pocket is allowed to remain and is covered over by flaps, the granulations which arise from this pocket are so exuberant as to block drainage. I have seen secondary operation necessary on this account, and death follow from just this error which appears so trifling.

10th. Diabetes seems to predispose to or be accompanied by vascular changes, as was shown by sinus thrombosis in one case and a subcortical cerebral hemorrhage and sinus thrombosis in the other; and that the removal of the thrombus in the later case and the establishing of return flows from the torcular and bulb ends of the sinus resulted in an extensive general thrombosis of the intracranial sinuses. When we find in diabetic cases a sinus thrombosis, and there is an absence of symptoms pointing to septic absorption, I believe it safer not to disturb the clot further than to open the vessel and remove the main portion of the thrombus and the corresponding external sinus wall, without establishing return flows; otherwise we may get extensive clotting in the remaining intracranial sinuses and unwittingly contribute toward death. (This was illustrated in Case 1. Case 4 illustrates the successful application of this principle.)

11th. The claim made by some that those cases showing 3 per cent. of sugar and over in the urine, if operated upon always terminate fatally, is unfounded—all of the cases of recovery had 3 per cent. or more; and of others that if diacetic acid and acetone are present the cases have a fatal termination, is also untrue.

Case 4 illustrates the fact that neither the amount of urine passed in twenty-four hours (5 quarts), the percentage of sugar (10 per cent.), nor the presence in the urine of diacetic acid and acetone (both present) together and in conjunction with the severest general symptoms

of the disease—excessive thirst, exhaustion, loss of weight, recurring boils, pruritis, and an easily disturbed pulse—is of definite and certain prognostic value, as the case recovered in spite of the fact of extensive mastoid destruction, epidural abscess, and thrombosis of the sigmoid sinus.

12th. So far as this limited number of cases has enabled me to determine, I consider dyspnœa (if the value of symptoms considered singly is of importance)—whether this develops prior to operation or subsequent to the anæsthesia—the one symptom of the greatest prognostic value. It points almost certainly to a fatal termination, in no instance have I seen such a case recover.

THE PROGNOSIS OF OPERATIVE PROCEDURES ON THE MASTOID PROCESS OF DIABETIC SUBJECTS.¹

By E. L. MEIERHOF, M.D.

THE element of risk in surgical procedures on the diabetic has not received all the attention that it deserves. Some of the latest and best works on general surgery barely touch on the subject. This indifference seems mainly due to the idea that under rigid asepsis the element of risk is very much diminished, even in the diabetic. That this is no doubt true is due to the fact that a considerable amount of general surgery is performed on non-suppurative cases, and with the absence of local or general infections in a very large percentage of cases the risk is kept at a minimum.

The otological surgeon rarely operates on cases where there is no suppuration, and consequently has to deal with more or less severe local infections accompanied often with systemic involvement. For this reason the otologist should have a greater interest in this question than the general surgeon.

At the meeting of the American Otological Society in the year 1895, Buck read a paper dealing with this subject. While this paper is the earliest one that I have been able to find dealing with the question of prognosis alone, there has been quite a number of contributions dealing with the liability of purulent otitis becoming

¹ Read before the Section on Otology, N. Y. Academy of Medicine, Dec. 13, 1906.

more readily complicated in the diabetic than in the non-diabetic. In his paper Buck was able to refer back as far as 1860 for the earliest reported coincidence of mastoid disease and diabetes. From this date to the time of the reading of the paper, he gathered ten cases reported from various authentic sources, together with four cases in his own practice. His deductions from his own experience and the study of cases from literature were that the mastoid operation in the diabetic is attended with a greater degree of risk than in the non-diabetic. Furthermore, he thought that the danger of a fatal issue would be materially lessened if the operation were undertaken earlier in such cases.

During the past ten years there has been a number of contributions dealing with purulent otitis and its complications in the diabetic. These contributions, in great part, deal with reports of cases, and from a study of these reports we are enabled to obtain a broader view on this subject. It is thought that there is something characteristic of mastoiditis in the diabetic, in so far that the disease manifests itself frequently in the mastoid without marked evidence in the tympanum; and furthermore the destruction of bone takes place more rapidly and extensively than under ordinary circumstances. The danger of the after effects of the narcosis is viewed with greater apprehension in these cases, as a number of fatalities have occurred 24 or 48 hours after operation, due to diabetic coma.

The incentive for writing on this subject is an experience with one of our well-known otologists, called into consultation in a case of acute purulent otitis with marked mastoid involvement, occurring in a diabetic subject and presenting every indication for operation on the mastoid. The age of the patient, sixty years, and the presence of $2\frac{1}{2}$ to 4 per cent. of sugar led the consultant to give a very unfavorable prognosis to the family of the patient, on account of his experience in a series of eight

cases occurring in his own practice or seen in consultation. All of these cases died within one to three or four days after the operation. Great stress was laid upon the danger of general narcosis in cases where the sugar was 3 or more per cent. The day after the consultation, the writer of this article became ill from an attack of grippe, so that another otologist took charge of the case. The substitute called into consultation another well-known otologist who did not by any means share the gloomy prognosis of the first consultant, so the family gave consent for an operation, which was done five days after the first consultation,—and about thirty-five days after the beginning of the otitis. The indications for operating on the mastoid only commenced to assert themselves about the middle of the fourth week of the disease. The mastoid was found diseased throughout, and in spite of the thoroughness of the operation and the excellent condition of the patient afterward, she died on the seventh day following the operation.

After this experience I became acutely interested in this subject of the prognosis of the mastoid operation in the diabetic, and I soon found a variety of opinions among men of large opportunities for observation. On the one hand, there are those who contend that in any case where there is 3 or more per cent. of sugar in the urine the prognosis is very unfavorable for operation. On the other hand, there are some who do not share the gloomy views of the first mentioned, and they are able to quote a number of cases that have fully recovered from a diseased mastoid after operation. It is easy to understand how there can be differences of opinion due to individual experiences. If perchance an operator should unfortunately meet cases that are far advanced in sepsis it would be expected that his results would be less favorable than those of one who had cases which afforded opportunity for more timely intervention. In my own case I could hardly have suggested an earlier operation,

as the indications for operating did not arise until a day or two before the first consultation. The discharge remained serous for quite a while, becoming purulent only shortly before the appearance of the more serious manifestations. In the beginning of the otitis the patient had marked tenderness over the tip of the mastoid, which disappeared only to return in connection with tenderness over the antrum and emissary vein; rupture of the drumhead occurred spontaneously twenty-four hours before the patient came under my observation. At no time was the temperature per rectum over 101° , until the symptoms became more urgent, when the temperature rose 2 or 3 degrees. A characteristic feature was the marked swelling of the posterior wall of the canal, reducing the fundus considerably and rendering drainage very difficult. The bacteriological examination of the pus showed the prevalence of the pneumococcus.

The literature furnishes, in spite of this experience, a sufficient array of cases to make us feel hopeful when we assume the responsibility of treating these cases of mastoiditis in the diabetic. More than fifteen years ago good results were obtained, and the indications for operating were not then so well developed nor the technique so complete as it is to-day. In the histories of the earlier cases the percentage of sugar is not mentioned. In more recent years, however, there are cases reported where the percentage of sugar is as high as 10 per cent., and in one case jaundice was present. In some cases the operation was done when the indications had been present for some time.

In 1899, Eulenstein of Frankfurt published a paper dealing with the subject of purulent otitis in the diabetic. He was able to report on fifty cases gathered from various sources. The object of the publication was to determine whether there is anything unusual about purulent otitis and its complications in the diabetic subject. In 1903, he published a second paper with the report of twenty

additional cases, making seventy cases altogether. For the purposes of my subject I am not able to utilize much of this material, as in some cases no mention is made of the percentage of sugar, and in others the percentage is under 2 per cent. However, there are a number of cases among these seventy and others to be mentioned later which ended favorably although the outlook was not encouraging. The following are some of the cases of recovery where there was a very high percentage of sugar:

O. Wolf of Frankfurt, in 1887, reported a case of acute purulent otitis with marked symptoms of mastoid involvement, with 7 per cent. of sugar, in which recovery took place without an operation. The patient was put on a very strict anti-diabetic diet, so that the excretion of sugar was lowered to 2 per cent. This case is cited incidentally, to show a recovery without an operation, in the presence of a high percentage of sugar.

In 1885 Schwabach reported a case from the year 1876, of a man 43 years of age who had 4 to 5 per cent. of sugar and a purulent otitis of six weeks duration that was successfully operated; in addition to extensive caries there was facial paralysis, which gradually improved. The patient died a year and a half after the operation, from gangrene of the lower extremities.

Moos reported a case in 1888 of a man fifty-five years old with an otitis of five months. The sugar was a little under 3 per cent. and there was marked swelling over the mastoid. A Wilde's incision was followed by a free flow of pus and a hemorrhage that lasted for three-quarters of an hour despite continuous digital compression. This patient made a good recovery with a cure of his otitis. (Possibly the lateral sinus was opened.)

In 1889, Kuhn of Strasburg reported a case of a woman fifty years of age with 5 per cent. sugar at the first examination, which was reduced by diet to $3\frac{1}{2}$ per cent. This patient had a discharge from the right ear for twenty

years. In the left ear a more recent process had developed. While under Kuhn's observation, both ears showed symptoms of mastoid involvement. The pus showed a mixed infection of streptococcus and staphylococcus. After two months of treatment a Wilde's incision was made on both sides but no attempt was made to go into the bone. This patient also made a good recovery.

In 1897 Koerner reported a case of a man forty-seven years of age where there was 5 per cent. of sugar. This was reduced to 4 per cent. One and a half hours after operation on the patient's mastoid the specific gravity of the urine was 1.034, and 2.8 per cent. of sugar. The patient made a good recovery. This case is the first one reported where an examination was made not only for sugar but for acetone, diacetic acid, and beta oxybutyric acid, according to the advice of Külz.

Dr. Buck's report of two cases of recovery from operations on the mastoid would be of greater value if the percentage of sugar were given. In one case—a man of forty-nine—the urine was stated to be loaded with sugar; the other case was a man of sixty-two, rather infirm in his appearance and gait, who successfully withstood an operation on both mastoids.

In 1892 Koerner reported a case of a man sixty years of age who had a large percentage of sugar, but did not state the amount. This patient died in diabetic coma, six months after a successful operation on his mastoid.

In 1898 Muck operated with success on a case with 2 per cent. of sugar, and catarrhal jaundice.

Friedrich of Kiel in reporting cases of otitis in connection with diabetes, mentions the case of a woman forty-six years of age with 2 per cent. of sugar, who died 6 days after a radical operation. A second case, a man of forty-two, a drinker with albuminaria, 5 per cent. of sugar, and a weak and irregular heart, was operated on in a limited manner with the result of removing the urgent

symptoms, although three months after the closure of the mastoid wound the ear was still discharging.

Barth, in 1901, treated a man of sixty-four who the year previous had a double iritis without known cause. This patient had 4 per cent. of sugar, which was reduced by a very strict diet to $2\frac{1}{2}$ per cent. After five months' treatment a radical operation was necessary which proved successful. Barth reproached himself for not having operated four weeks after the onset of the disease.

Witte and Stürm, assistants to Koerner, reported in 1901 the case of a very corpulent man, sixty-three years of age. He had 4 per cent. of sugar the day before his mastoid was opened and an extra-dural abscess exposed. The wound in this case was closed in twenty-one days.

Stürm and Suckstoff in 1902 had a case, also at Koerner's clinic, where there was $11\frac{1}{2}$ per cent. of sugar. The operation was done under chloroform narcosis and the wound was closed in 33 days.

Eulenstein furnishes two cases in 1902, of mastoiditis successfully operated upon. In the first case the amount of sugar ranged from $3\frac{1}{2}$ per cent. to $\frac{1}{2}$ per cent.; and in the other the range was from $4\frac{1}{2}$ per cent. to $\frac{1}{2}$ per cent.

L. Wolf, also in 1902, gives the history of a woman of fifty years with 3 to 5 per cent. of sugar, and a purulent otitis with marked tenderness over the mastoid, who fully recovered without an operation.

F. Grossmann of Berlin, in a contribution to the *Festschrift* of Prof. Lucae in 1905, furnishes the histories of ten cases of otitis in diabetics. Of these, two were cases of special interest for our purpose. One was a man of sixty-eight who had 3 per cent. of sugar and was under observation one day only, but on account of the urgency of the symptoms his mastoid was opened without delay. He made a good recovery. The other case was a woman, fifty-four years of age, with $2\frac{1}{2}$ per cent. of sugar, who was operated upon three days after being first seen. Two days

after the operation active delirium manifested itself for one day, but a good recovery followed.

McCuen Smith of Philadelphia published this year the history of a case with 4 to 10 per cent. of sugar, where there was extensive destruction of the mastoid cells, and a gravity abscess (Bezold's form). This patient made an uninterrupted recovery. He died a year afterward of œdema of the larynx.

I think for all practical purposes a sufficient number of cases has been cited from various reliable sources to show that we can approach our diabetic cases in a hopeful spirit—even when there is a high degree of glycosuria. We certainly have bad results in non-diabetic cases, and the presence of sugar in the blood is certainly of no advantage, when it is recognized that the diabetic resistance to infection is very much diminished.

I have been compelled to omit many interesting points in the cases reported, two of these being the cases of severe otitis in diabetics which recovered without surgical intervention. We should not, however, place too much dependence upon this possibility. If general narcosis is such a serious factor in the prognosis, we can resort to cocaine infiltration in these cases, as the bone is frequently very much softened and broken down, rendering the operation comparatively easy. If it is absolutely necessary to resort to general narcosis, we must operate rapidly in order to obviate a long anæsthesia, and be content with a less thorough operation than is usual.

Some of the German otologists, on the advice of Naunyn, recommend the giving of large and frequent doses of bicarbonate of soda before and after the operation, so as to lessen the danger from acidosis.

As to preliminary dieting, we do not always have time to resort to this, because of the urgency of the symptoms, but where it is possible we should lessen the amount of free sugar in the blood, as shown by the urinary examination.

It is difficult to generalize, as each case affords its own peculiarities. Unfortunate results may follow where there is a low percentage of sugar, and success may attend cases where there is a high percentage of sugar, even combined with the presence of acetone and diacetic acid in the urine, which latter is always regarded as the precursor of coma. With our constantly improving laboratory methods we ought to know much more about the general as well as the local condition of our patients than in the past, thus rendering possible a more intelligent prognosis for the mastoid operation in the diabetic.

Friedrich, in his book on *Rhinology, Laryngology, and Otology, and their Significance in General Medicine*, says that a high percentage of sugar is an absolute contra-indication for operation, as it increases the danger of post-operative diabetic coma, and is followed by a rise in the percentage of sugar, which he thinks is the direct result of chloroform narcosis.

Koerner, however, does not believe that the anæsthetic is the cause of hastening the coma after the operation, as coma has also come on after an operation where local anæsthesia has been employed. Koerner advises that the patients be operated on in the early part of the morning after the physiological fast, as diabetics do not well bear deprivation from food and drink for any length of time. This refers to cases when general narcosis is employed.

Therefore, in view of the tendency in any diabetic for acute purulent inflammation of the middle ear to assume a destructive course in the mastoid, we should advise that the mastoid be opened when it is observed that there is no decided lessening of the secretion of pus within a few days, even in the absence of other classical symptoms. To be timid in advising an operation on account of the diabetes is in my judgment a mistake; for this timidity postpones an operation until the chances of success are diminished. If we wait until the patient has a high

leucocytosis with a great increase of the polynuclear cells, or any other marked symptoms, or delay because there is no decided diacetic reaction in the urine, we court danger. If we face a combination of serious symptoms when we first see a case, the patient should be given the opportunity of an operation at once, as otherwise there would be only one probable outcome.

There is every reason to believe that with the accumulation of experience on this subject the future will develop constantly improving results of operations on the mastoids of diabetics even with the presence of a high percentage of sugar in the urine.

BIBLIOGRAPHY.

- BUCK, *Transactions of American Otological Society*, 1895.
EULENSTEIN, *Archiv. für Klin. Med.*, vol. ii, xvi.
O. WOLF, *Bericht über die 60 Versammlung Deutsch Naturforsch.*, 1887.
SCHWABACH, *Deutsche. Med. Wochenschrift*, 1885, No. 52.
MOOS, *Deutsche. Med. Wochenschrift*, 1888, No. 44.
KÖRNER, *Zeitschrift für Ohrenh.*, vol. xxviii.
KÖRNER, u. v. Wild, *Zeitschrift für Ohrenh.*, vol. xxiii.
KÖRNER, *Mitteilung aus den Grenzgeb. d. Med. u. Chirurgie.*, 1902, xii.
MUCK, *Zeitschrift für Ohrenh.*, vol. xxxv.
FRIEDRICH, *Rhinol., Laryngol., and Otology*, p. 84.
BARTH, *Zeitschrift für Ohrenheilkunde*, vol. xxxviii.
STURM and SUCKSTORFF, *Zeitschrift für Ohrenheilkunde*, vol. xxxix.
STURM and SUCKSTORFF, *Zeitschrift für Ohrenheilkunde*, vol. lxvii.
LUDWIG WOLF, *In Eulenstein reports*, 1902.
F. GROSSMAN, *Festschrift to Prof. Lucae*, 1905.

THE PRESENT STATUS OF THE QUESTION OF PROGRESSIVE SPONGIFICATION OF THE LABYRINTHINE CAPSULE (OTO-SCLEROSIS).¹

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THE nomenclature of the disease process which we are about to consider is not satisfactory. The term "oto-sclerosis," introduced by von Tröltsch, is, in the light of more recent investigations, misleading, because the pathological process which it is now meant to express is not one of sclerosis at all; quite the opposite, it is a spongi-fying process, of which "rarefaction" is but a poor translation. Again, "spongification (or rarefaction) of the labyrinthine capsule," while expressive of an important portion of the condition, does not take cognizance of a most important factor, namely, the fixation of the stapes in the fenestra vestibulum. "Progressive deafness" is not suitable for all cases, for in not a few the process causing the hardness of hearing ceases entirely, or is so slowly progressive as to be scarcely noticeable; more will be said on this point later on when considering prognosis. Such terms as "otitis media catarrhalis sicca," "dry middle-ear catarrh," "otitis media imperplastica" (de Rossi), are no longer tenable in this connection, as we have here to do with a pathological process which primarily attacks the dense bone forming the bony labyrinthine capsule and that about the fenestra ovalis. Nor may we use an eponym to express the disease, as our

¹ Read before Section on Otology, N. Y. Academy of Medicine, Jan. 10, 1907.

knowledge of it has been the result of not one man's labor, but of many.

The development of our knowledge of the disease may be historically divided into three phases. The first phase began with the recognition of stapes ankylosis as a cause of deafness. The second stage was inaugurated by the discovery that the disease is a primary circumscribed process in the bony labyrinthine capsule, dissociated from demonstrable changes within the tympanic cavity. The third stage is that in which occurred further development in its micro-pathology and the formulation of diagnostic methods.

That deafness may result from fixation of the stapes in the fenestra ovalis was recognized by Valsalva in his *Tractus de aure humana* (Cap. 11, x, p. 24, 1724); by Morgagni in his work *De sedibus et causis morborum* (Lib. 1, Epist. xiv, Art. 11, 1761); and by Meckel in his inaugural dissertation, 1777. From this time to the middle of the last century no further development occurred. In 1849, Toynbee, in the *Medico-Chirurgical Transactions*, vols. 32 and 38, and in 1857, in his Descriptive Catalogue, published his pathologico-anatomical researches in diseases of the ear, based on 1149 preparations. Among these he found 126 specimens of ankylosis of the stapes. The value of these specimens was greatly reduced by the fact that they were accompanied by very scant clinical observations, but the publication gave a fresh impetus to the subject, and in the following thirty years the subject was enriched by the appearance of much research work by von Erhard, Kramer, Voltolini, von Tröltsch, Politzer, and many others. Those who desire a full account of the historical development of this stage I would refer to Panse's book, *Die Schwerhörigkeit durch Starrheit der Paukenfenster*. The net result of all this work was not great. It definitely settled the various forms of ankylosis and the changes occurring secondarily thereto. The fixation was regarded as a direct result of

acute or chronic catarrhal or suppurative processes in the middle ear, of "sclerotic (dry)" catarrh or of circumscribed periostitis. The tardy development of knowledge of this disease was due to two factors: (1) The difficulty of obtaining post-mortem material that had been sufficiently observed during life; (2) the lack of correct diagnostic measures. As you well know, the process which causes synostosis of the stapes is a harmless disease as regards life. The temporal bones of those so afflicted can be obtained only when death results from some intercurrent disease or from violence. Regarding the second point, it is sufficient to mention that as late as 1870 Schwartze believed that the only certain means of ascertaining the fixation of the stapes was by directly testing its mobility with a probe introduced through an artificial opening made in the tympanic membrane.

The second stage dates from 1861, when Moos published the results of his examination of a case in which he found stapes ankylosis *without demonstrable change in the tympanic mucosa*. He ascribed as cause of the ankylosis a primary otitic process occurring in the bone itself. In a second case he ascribed the ankylosis to a circumscribed periostitis occurring in the labyrinthine capsule. This publication was quickly followed by others, all agreeing in the main as to the pathological findings, but differing as to the exact histological origin of the process, that is, as to whether the pathological change originated in periosteum, bone, or cartilage.

The third phase in the history of the development of our knowledge of the disease began with Bezold, who, in 1885, before the *Versammlung Süddeutscher Ohrenärzte*, in München, reported the first case of stapes ankylosis, in which the correctness of the clinical diagnosis was verified by the results of a microscopic post-mortem examination and manometric tests of stapes mobility; while he, at the same time, laid the foundation of functional tests as aids to diagnosis of the condition.

Soon after this the microscopic examination of specimens of the temporal bone added greatly to the advancement of the subject. Politzer was the first to illustrate the microscopic findings of stapes ankylosis in his textbook published in 1887. To L. Katz belongs the honor of publishing the first case in which stapes fixation was diagnosed during life by the results of functional tests, and which was microscopically examined after death. Katz's second case can hardly be admitted as evidence. The temporals, which were examined, had been taken from a heterogeneous collection contained in a jar in the Insane Asylum. They were unaccompanied by any history whatever. They show merely osteoporotic changes not only in the petrous portion, but in the malleus and incus. And the process with which we have to do in spongification (oto-sclerosis) is not identical with osteoporosis. This latter is a senile process and is characterized by resorption (of the most minute kind) without any particular apposition of new tissue.

Since Katz's publication in 1890, there have been less than forty cases reported, in which the diagnosis made during life has been confirmed by section. While this series may not be considered large, yet enough positive knowledge has been derived therefrom to warrant us in regarding many important features of the disease as established, though some points, as regards its nature, etiology, and pathology, remain under discussion. Among the latter is the question as to whether the changes occurring about the foot-plate of the stapes and in the bony labyrinthine capsule are primary or secondary to disease of the middle ear. By far the greater mass of evidence tends to prove the *primary* involvement of the foot-plate of the stapes and the region surrounding it in the fenestra ovalis and the bony labyrinthine capsule. While the cases reported by Scheibe and Habermann, besides the changes in the dense bone of the capsule and in the fenestra ovalis, showed evidences of a previous

middle-ear suppuration, or changes in the tympanic membrane, the greatest number of examinations by observers like Siebenmann and Bezold, *showed no changes whatever in the middle ear*. Further, isolated islands of spongification in the region of the internal auditory canal and in the cochlea have been observed by Politzer, Siebenmann, which have had no connection whatever with the middle ear,—have been separated therefrom by normal bone. It would seem, therefore, that we are justified in regarding the disease as one which primarily affects the region about the foot-plate of the stapes and the bony labyrinthine capsule, independently of suppuration or catarrhal middle-ear disease, and in believing that the changes which have been found in the middle ear are adventitious, or complicating manifestations, or entirely different pathological processes. With these preliminary remarks we may define oto-sclerosis as a disease of the auditory apparatus, which is manifested clinically by loss of hearing, unaccompanied by change in the tube or tympanic membrane, by certain characteristic reactions to functional tests; and, pathologically, by an early loss of mobility of the stapes by osseous ankylosis between it and the fenestra ovalis and by resorption of the normal and reposition of altered osseous tissue in the bony labyrinthine capsule which reduces its density.

PATHOLOGY.

The principal factors of interest in the pathology of progressive spongification are grouped about the changes which occur about the foot-plate of the stapes and those in the bony walls of the labyrinthine capsule—the cochlea, semicircular canals, and vestibulum. And in order to refresh memory you are invited to participate in a brief description.

The stapedio-vestibular articulation is not a true joint, but rather a symphysis. The bone on both the stapedial

and fenestral sides is covered with a delicate layer of cartilage to which is attached the annular ligament, binding the two together at all points. As all bone is primarily laid down in tissue closely akin to that composing connective tissue and ligamentous structures, it may easily be imagined—and, in fact, it does occur—that osseous transformation (metaplasia) within these structures takes place readily under favorable conditions. Again, if we examine the stapedio-vestibular symphysis, the relatively greater length of the annular ligament at its anterior portion in comparison to that of the posterior portion will prove the greater mobility of the former portion of the symphysis. The stapedus muscle, contracting, fixes, to a relative degree, the posterior edge of the foot-plate of the stapes in the fenestra ovalis. It is the anterior portion of the foot-plate, therefore, that in the auditory function responds to the greatest vibratory amplitudes. It must be admitted as a corollary that in this region the greatest amount of friction or irritation occurs. And it is a suggestive fact of greater significance than a mere coincidence that this region is the point of predilection for the occurrence of those pathological changes which result in osseous ankylosis.

It is valuable in our clinical work to keep in mind that fixation of the stapes may occur in conditions other than spongification. These may be grouped under three heads. In one group occur those cases in which the mobility of the stapes is more or less decreased by thickening of the mucosa or the periosteum, or by strands of organized inflammatory material, or adhesions within or about the pelvis of the fenestra ovalis and stapes, which have their origin in simple acute or chronic inflammatory processes. In such cases deposits of chalk may be laid down in this inflammatory nidus, thus decreasing still more the mobility of the stapes. This form is the ankylosis spuria membranacea of Erhard, and is easily differentiated by the presence of catarrhal

factors in the nose and post-nasal space, in the tube, and by the characteristic otoscopic picture presented by the tympanic membrane, and by the increase of audition after inflation, if the stapes retains any mobility.

A second form is that known as temporary fixation of the stapes, which occurs in closure of the Eustachian tube, with a high degree of retraction of the membrana tympani. This condition is differentiated by the Gellé test, and by the restitution of stapes mobility coincident with the disappearance of the closure of the tube and retraction of the tympanic membrane. The other form is the one now under consideration, and occurs as a part of the spongifying process of the labyrinthine capsule.

As to the origin of the spongifying process, little is certainly known. Whether the process originates in the perichondrium or in the bone, or in the periosteum is unsettled. Bezold leaves the question open. Politzer believes that it originates in the bone itself; while Siebenmann, who has gone deeper into the histology of the process than, perhaps, any other, advances an original explanation of its origin and etiology. He regards it as "the final stage of a developmental process which does not normally take place in the petrous bone, but which is the rule with other bones." The normal labyrinthine capsule remains throughout life unusually rich in remnants of primary cartilage. The remnants are found most frequently at the very point of predilection for the spongifying process. In all the long and flat bones of the skeleton there is a continuous loss and regeneration after birth, so that the bone continues to increase in size without changing its external shape. In the labyrinthine capsule, however, we have an exception, as its ultimate size is attained at birth, and later decrease or increase takes place only within slight limits. He regards this as the reason why so many cartilage remnants are retained in the labyrinthine capsule to an old age.

The changes which take place in the labyrinthine

capsule and in the stapes may be regarded as a process of resorption of old, and apposition of new, metamorphosed tissue. Between the unchanged bone and the adjacent new bone Pommer's cement line at first may be seen, but this gradually disappears as the process advances. The first discernible change at the beginning of the process is that the walls of the Haversian canals lose their tinctorial affinity for hematoxylin and carmin. They then become enlarged in consequence of the resorption of their walls. The co-operation of multinuclear osteoclasts may occasionally be observed, but not always. While this process of resorption is progressing, the apposition of new osteoid tissue is observed at its confines. Broad, flat osteoblasts form a peripheral zone to the decalcified, osteoid tissue, which stains intensely red with carmin. This osteoid zone is still further differentiated from the neighboring bone by a loss of clarity and by innumerable heterogeneous, large, thick bone cells, which contain one or more nuclei. All the cartilaginous remnants in the interglobular spaces are resorbed and replaced by this osseous mass. The cartilage of the foot-plate and that of the fenestra become highly vascularized by the formation of new blood-vessels, are resorbed, and in the end are replaced by spongiosa. The newly-formed bone gradually assumes a lamellar formation; the medullary spaces become less rich in cells and blood-vessels, while the connective tissue becomes more abundant. The changes about the foot-plate of the stapes are varied. Occasionally it and the annular ligament are amalgamated into one solid mass, with the fenestra ovalis. In other cases single delicate bridges of osteoid tissue connect the foot-plate with the fenestra. Or the bridge may be incomplete, so that a true ankylosis is not consummated. The distribution of this osteoid tissue in the cochlear walls and semicircular canals occurs without any relation to its occurrence about the foot-plate. Isolated foci have been observed in the region of the porus acusticus,

in the semicircular canals, as well as in the vestibular walls, entirely separated from the stapes. The same process may occur around the round window until its obliteration is more or less complete. The spread of the process tends always towards the endosteum, so that the labyrinthine fluid may be separated from the enormous lymph spaces of the newly formed spongiosa only by a very delicate membranous partition.

As the labyrinthine capsule of all the higher animals is composed of markedly compact bone, we are justified in assuming that this quality of density is essential to normal hearing. The separation of the two lymph systems—that of the perivascular lymph spaces of the Haversian canals and of the labyrinthine lymph—is essential to the same function, as witness the care with which nature has almost completely separated the vascular supply of the endosteum and that of the surrounding bone. "The blood-vessels of the endosteum communicate in only a few places through narrow capillaries with the blood current of the bone. . . . The lymph circulating in the Haversian canals is shut off from the labyrinthine lymph" (Siebenmann). The great importance of these facts will be brought out further when treating of functional reaction.

ETIOLOGY.

The cause of oto-sclerosis is still to be found. Gradenigo's researches on its bacteriology resulted negatively.

Sex.—It is a disease which affects women more frequently than men. According to Bezold's statistics, in general ear diseases, 58 per cent. were in males, and 42 per cent. in females; while of those suffering from oto-sclerosis 61.2 per cent. were females. Denker gives 58.2 per cent. females and 41.87 per cent. males. Hartmann's statistics based on 33 cases in which stapes ankylosis was proven by post-mortem examination bear out the other

figures. Of the 33 cases, 18 were females and 15 males. My own statistics, based on cases accurately observed in private practice and in the Illinois Eye and Ear Infirmary, give not quite 60 per cent. females. Other observers (Panse, Walb, etc.) agree in the predominance of the female sex. The changes occurring in the skeleton, the anæmia, the anomalies of nutrition which are peculiar to the puerperium, suggest a connection between the two conditions. Indeed, in not a few instances patients have distinctly dated their aural symptoms from the occurrence of a pregnancy. That in 88.8 per cent. (Bezold) both ears are affected would speak for its cause being constitutional and not local. Out of 306 cases, Denker elicited a history of heredity in 40.5 per cent., Bezold 52 per cent., Siebenmann in 35 per cent. That heredity bears a direct relationship to the disease is now conclusively proven by Koerner's case in which from marriage of two individuals affected with spongification twelve children were born, all of whom were afflicted with the disease without exception. In my own cases 71 per cent. gave a history of heredity. The transmission seems to have a tendency to take place through the female branches. Harmful embryonal influences are more apt to affect the female than the male.

Oto-sclerosis is a disease of middle age. It rarely begins before the twentieth year, though its occurrence before that age is not unknown. In not a few cases a history of exposure to severe cold inaugurates the train of symptoms, which resulted in speedy deafness. Overheating of the body, accompanied by exhausting exertion, was followed in one case, a young lady, who has been brought to my attention, by total deafness.

Habermann is a strong supporter of the theory that syphilis is the causal factor in oto-sclerosis. He points out the coincidence of the time of life at which labyrinthine rarefaction begins and that in which luetic infection is most frequently acquired; and that there is a similarity

between the histological changes found in labyrinthine rarefaction and syphilitic and parasyphilitic osteitis. The long duration, the subsequence of active foci, the formation of spongy hyperostosis and exostosis, the resorption of old bone and reposition of new, as found in labyrinthine rarefaction, have their analogues in syphilitic osteitis. He explains the absence of caries and necrosis in labyrinthine rarefaction by ascribing to the virus diminished virulence, and calls to his support the observations of Volkmann and Saloweitschik, that even osseous gumma undergoes necrosis only under unfavorable conditions. He also brings to his support clinical observations in which a certain number of cases gave evidence of syphilitic infection. That there are many more cases of syphilis which have involvement of the internal auditory apparatus in the secondary stage than is generally supposed, I believe, yet I would not accept at the present time the theory that lues, acquired or hereditary, is the etiological factor in all cases of labyrinthine rarefaction. Against such a belief is the fact that although more men than women are afflicted with syphilis, the reverse is true of oto-sclerosis. Further, oto-sclerosis bears no cogent relationship to the wide dissemination of syphilis.

FUNCTIONAL TESTS AND DIAGNOSIS.

The diagnosis of pure, uncomplicated oto-sclerosis is not difficult. Given a case with increasing hardness of hearing, a tympanic membrane that is normal, or nearly so, a normal Eustachian tube, and in which the Bezold triad is elicited, the diagnosis is clear. Bezold's triad consists of (1) prolonged bone conduction, (2) a markedly negative Rinne, and (3) the elevation of the lower tone limit. In all cases in which the diagnosis of stapes ankylosis has been made *intra vitam* on this symptom-complex, and which have been examined *post-mortem*,

the diagnosis has been confirmed without exception. The analysis of these tests would lead us into theoretical discussion of too great length. We will, therefore, pass on to the consideration of a form of rarefaction of the labyrinthine capsule which gives other reactions, and the differentiation of nerve degeneration.

There is strong reason, based on post-mortem evidence to believe that certain functional reactions vary in direct ratio as to whether the disease process preponderates around the vestibular window or along the walls of the cochlea. The two elements oppose each other—that is to say, increase in stapes ankylosis lengthens bone conduction and causes the Rinne test to become more markedly negative. On the other hand, preponderance of the rarefying process in the labyrinthine capsule tends to shorten Schwabach and decrease the negativeness of Rinne. As it happens that the regio predilectionis is situated at the upper and anterior portion of the vestibular window, stapes ankylosis most frequently predominates, but there are cases on record in which the reverse is true. The ankylosis was incomplete, the labyrinthine capsule was greatly affected. In these cases the bone conduction was reduced or negative, and the Rinne negative shortened. No nerve involvement was found on post-mortem examination to account for the decreased bone conduction.

In addition to the fact that in all the higher animals, as has already been mentioned, the labyrinthine capsule is composed of very dense structure, Siebenmann adduces from the association of marked loss of aërial and osseous audition in those cases with spongification of the bony capsule *without* nerve involvement, and the absence of or incomplete ankylosis of the stapes, that compactness of the capsule is essential to normal hearing. Not only is the physical quality of density changed in labyrinthine rarefaction, but, as the process progresses, the perilymphatic spaces of the Haversian canals, increasing in

number and size, approach the labyrinthine cavities, so that the perivascular lymph spaces and the perilymph are at last separated only by the most delicate connective-tissue septa. These changes in relation between the peripheral lymph system and the perilymph must produce changes in the pressure condition and density of the latter. As changes produced by diffusion of liquids cannot be excluded, chemical alteration in the perilymph may contribute to the loss of function of Corti's organ. Not only may the two lymph systems be separated by only a delicate membranous partition, but this partition may be absorbed. Under these circumstances perforations occur, so that the two lymph systems are in actual uninterrupted communication. In this way are explained those attacks of sudden loss of hearing and decreased bone conduction, pistol-shot-like sounds, etc., occurring in the course of oto-sclerosis, in which hearing slowly, incompletely, or never returns to its previous condition. In all cases of oto-sclerosis the labyrinthine capsule, aside from the changes about the stapes, is always affected, and, according to Siebenmann, from whom I have so extensively quoted, always tends to modify results of tests for aërial and osseous conduction. When we compare the degree of prolongation of bone conduction in the cases reported by Bezold, for instance, in which complete stapes ankylosis was proven post-mortem, with the prolongation of osseous conduction when stapes fixation is produced artificially, or in cases of complete closure of the Eustachian tube, with extreme retraction of the drum-head in young individuals, we find that in the latter instances there is a relatively greater increase of osseous conduction as well as greater aërial auditory power. It is a good working principle to remember that the changes occurring in the labyrinthine capsule of the cochlea, apart from stapes ankylosis, tend to decrease audition, both aërial and osseous, while those occurring about the foot-plate of the stapes, which

result in a greater or less degree of fixation, tend to increase bone conduction and decrease aërial, especially for low sounds. As one or the other pathological element predominates, the results of functional tests, especially those for osseous conduction, will vary.

In cases of oto-sclerosis, with decreased bone conduction, we have four tests with which we may in the large majority of cases differentiate nerve deafness. First, loss of the lower tone limit. Second, retention (comparative) of the upper tone limit. Third, increasing aërial auditory duration as the vibratory oscillations increase numerically. Fourth, Gellé test.

The loss of the lower tone limit is, perhaps, the most constant symptom in oto-sclerosis. If this symptom is present, even in those cases with marked loss of the upper tones, shortened Rinne, and an inversion of duration of the ascending scale, we are justified in suspecting, together with nerve degeneration, the existence of rarefaction, except in those cases of congenital deafness or those which result from acute labyrinthitis, or in cases of fracture of the base of the skull.

There is rarely much loss of the upper tone limit in uncomplicated labyrinthine spongification — probably never below the fourth degree of Edelman's Galton pipe. As the high limit descends below this point, or as islands of defect in the high scale develop, nerve involvement becomes more likely, as is occasionally the case in advanced types of spongification.

The third reaction in our list was inaugurated by A. Hartmann, who found that in oto-sclerosis the aërial conduction increased in duration as the number of vibrations increased. For this purpose it suffices to employ the octaves from C to c⁴. In nerve degeneration this reaction is reversed: duration of aërial conduction diminishes as the scale is ascended.

The value of the Gellé test is variously estimated by otologists. I have used it for a number of years, and find

that it is of great service in controlling Rinne test, especially in cases of oto-sclerosis. I agree in the main with Gellé's deductions:

1. A negative Rinne combined with a negative Gellé permits the exclusion of nerve involvement.
2. A positive Rinne and a positive Gellé indicate nerve deafness.
3. A positive Rinne and a negative Gellé are strong presumptive evidence of stapes fixation and nerve involvement.

To recapitulate the points in diagnosis:

1. The patient is examined with the otoscope and the hearing distance for whisper ascertained. In case the otoscopic examination discloses evidence of an inflammatory process in the tube or cavum, catheterization is at once performed and the hearing distance again taken. In case this is not characteristically increased, we proceed as in cases with normal tube, with
2. Testing for the lower tone limit. Frequently we find in cases in which hearing for whisper is not markedly affected, and yet the lower tone limit is elevated to 36 d.v. As the hardness of hearing increases, the hearing for lower tones diminishes, so that in a case in which the voice may still be perceived at very close range, the lower tone limit is found to be g^1 . When the patient perceives a lower tone than 32 d.v., we must search elsewhere than fixation of the stapes for the hardness of hearing (Bezold).
3. Then we test the osteo-tympanal conduction for low tones, using fork A. In uncomplicated cases where there is stapes-anchylosis Schwabach is invariably prolonged over the normal.
4. We then may proceed with Rinne's test with higher forks (a^1 , a^2). In the majority of cases the bone conduction is found to be prolonged, but occasionally it is decreased from the normal, but on placing the fork opposite the concha it is no longer heard. In other

words, the bone conduction is either equal to or greater than the aërial conduction. It is well to measure in seconds the osseous and aërial conduction, and to this end a split-second stop watch serves a valuable purpose. When these reactions are elicited in a case of hardness of hearing in which no inflammatory action is present, as is shown by auscultation of the tube and otoscopy, the diagnosis of spongification of the labyrinthine capsule with ankylosis of the stapes is complete. If in cases in which inflammatory processes are present in the tube and cavum the same reactions are elicited, we should not be deceived into a false optimism, but our prognosis should be most guarded, notwithstanding the slight improvement in hearing for the voice, which may follow inflation. The reactions prove stapes immobility, and whether this is due to spongification or is temporary (or permanent), and due to simple inflammatory processes in the pelvis of the oval window must be determined by successive observations.

And this leads us to the prognosis. There are two classes of cases to which we must give the worst prognosis, both as to rapidity of course and extreme loss of hearing, namely, those in which the umbo has the peach-blow color, which is due to the hyperæmia of the first turn of the cochlea showing through the tympanic membrane, and those in which islands of defect occur in the upper tones, *i. e.*, those of the Galton whistle.

Having become acquainted with the nature and seat of the pathological process which we are considering, the futility of those procedures which are so useful in overcoming the inflammatory processes of the tube and cavum becomes at once apparent. Indeed, in a great many cases of progressive spongification they are worse than useless—they are distinctly harmful. Yet we may do much toward re-establishing hope in the minds of those who suffer from this disease by assuring them that the process is very slowly progressive, and that they will

have in all probability serviceable hearing for a long time; that they are not inevitably to be the victims of complete deafness, and that the disease may come permanently to an end at any time. We know too well that there are cases in which the course is rapid, and that there are others in which sudden deafness occurs in cases which have apparently been but slightly affected, but these are of such rare occurrence that we may ignore them, at least as far as our prognosis to the patient is concerned.

We may with propriety assume the same attitude in our prognosis towards the tinnitus and vertigo that occasionally occur in these cases. The assurance that these are not due in any way to brain disease, that they do not portend mental impairment, is often accepted with the greatest satisfaction and relief of mind by the patient. He must be cautioned against allowing the tinnitus to prey upon the mind, he must be encouraged to ignore it as much as possible, with the authoritative statement that it will not become unbearable, and that it may and probably will become less or disappear altogether in the due course of the disease.

Another point which I must touch on is the question as to whether those afflicted with the disease should marry. As I have already said, the puerperal state occasionally serves to initiate the disease or increase the deafness. That it is a disease in which heredity plays a prominent rôle, there can be no doubt. Surely a man and woman who are both the victims of spongification of the labyrinthine capsule should be warned against marriage for the sake of the offspring, but I am not in accord with Koerner's doleful axiom that those in whose families the hereditary tendency toward spongification of the labyrinthine capsule is manifest should be forbidden the marriage state, that their sad inheritance may end in the grave with them.

Treatment.—If the usual conservative means of treating inflammatory disease of the tube and middle ear are

useless in combating the inroads of spongification of the capsule, so are operative procedures: tenotomies, ossiculectomies, myringotomies, etc. I have had ten cases on small doses of phosphorus for two years. These have not changed materially one way or another, as proven by control tests. But the same may be said of other cases that have had no treatment. It is unnecessary to say that if intercurrent attacks of simple inflammation occur they should receive immediate attention. In the plethoric, purgation is followed by benefit, and in the gouty, the administration of iodine preparations is occasionally followed by amelioration of the tinnitus and increase in hearing.

All who are afflicted with spongification should be cautioned against over-exertion, mental or physical. Overheating and chilling of the body have been frequently followed by marked exacerbation and complete and permanent deafness. But let us bear in mind the fact that we have at the present time no remedy *per se* against the disease, spongification of the labyrinthine capsule. What laurels await him who first shall find the golden key that shall unlock these deaf ears!

In conclusion, I wish to acknowledge my indebtedness in the working out of this paper to the brochures of Panse, Stern, and Denker.

OUR FAULTY METHODS OF BRAIN LOCALIZATION IN INTRACRANIAL LESIONS COMPLICATING AURAL DISEASES.¹

By S. MACCUEN SMITH, M.D., PHILADELPHIA, PA.

IT is not my intention to treat the subject of intracranial complications in an exhaustive manner, but merely to bring it to your notice, with the hope that the discussion which follows will establish some points in differential diagnosis of brain lesions complicating aural disease.

In determining the presence and location of a brain tumor, where the patient's life is in no immediate danger, distinct localizing symptoms can be waited for, and a definite diagnosis can be deferred; but in a case of intracranial suppuration, in which a life may be saved by immediate action, or sacrificed by delay, we have an altogether different problem confronting us.

This extremely difficult question resolves itself into two parts:

First: Whether or not a cerebral abscess is present.

Second: What is its location?

A critical analysis of the manifold symptoms will usually enable us definitely to determine the former, but an accurate, unqualified answer to the latter is still extremely difficult and in most instances impossible of precise interpretation. Each succeeding generation has

¹ Read before the Section on Otology of the Academy of Medicine, in New York, Feb. 8, 1907.

produced its investigators, profoundly learned and skilled in the dissecting room and at the autopsy, and yet, as Prof. Keen has pointed out, "fifteen years of experimentation (vivisection) have taught us more than the previous fifteen hundred years of careful observation and post-mortem examinations."

We must respectfully defer to those best qualified to determine the value of continued vivisection, in its relation to additional knowledge in *exact* brain localization. Judging, however, from the remarkable progress made in the recent past by those pursuing these scientific and humane investigations, it does not seem unreasonable to predict that the profession, in the near future, will be in possession of knowledge, the proper utilization of which will be the means of saving hundreds of valuable human lives that to-day are being sacrificed unnecessarily,—the anti-vivisectionists to the contrary, notwithstanding. Only with such knowledge at our command will we be able to emulate the brilliant achievements accorded localization through the motor area.

We feel that we know something of the area presiding over sight, but much less of general sensation, hearing, smell, and taste, while that controlling the intellect is still almost wholly in the dark. The establishment of invaluable comprehensive facts regarding the motor area was made possible only by scientific experimentation, mostly on the lower animals. As conclusive proof that the results thus obtained have more than justified the methods employed, I have only to remind you of the brilliant achievements of the latter-day surgeon and his co-workers in motor localization and all that appertains thereto.

In uncomplicated cases our methods of localization are fairly accurate and can be relied upon in the majority of instances. Unfortunately, however, most of the patients coming under our observation present symptoms so complex, and therefore so unreliable and confusing, that we

are often greatly perplexed in our efforts to accurately locate the intracranial lesion, and finally are compelled to arrive at a diagnosis by the process of exclusion, which frequently means little more than guesswork. This procedure, to say the least, is unscientific and in some respects reprehensible and unbecoming a learned profession.

It may be justly claimed that by personal intuition or some other occult power of reasoning, our success in locating and evacuating intracranial abscess formations so largely predominates that criticism of our failures, in view of recent advances made in this direction, is unfair. At the same time, in a patient presenting the symptom-complex, and these are the cases usually met with, we may select a point for operation without tangible, or at least convincing, proof of a correct diagnosis. The exigency of circumstances naturally impels such action, and largely justifies this "hit-or-miss" practice, inasmuch as prompt evacuation of the pus offers the only possible means of relief. Other things being equal, the writer would select the temporo-sphenoidal region for operation, from the fact that he believes this locality most frequently involved, whereas another surgeon, for similar reasons, would select the cerebellum. It is possible, but unlikely, that both regions may be implicated. Should we fail to find pus in the locality primarily selected, it then becomes our duty to explore another, thus subjecting the patient to the shock and danger incident to two or more operations on the delicate structure of the brain. It is indeed true that under modern surgical practice and aseptic precautions, the brain will tolerate almost unlimited exploratory measures. Nevertheless, we must remember that each minute particle probably has its own special function, and physiologically is so arranged that the functional harmony is unbalanced in direct proportion to the molecular disturbance, as well as by the locality involved. This is especially noticeable in

the impaired mentality and other abnormal manifestations observed in some patients following operations on the brain.

We all recognize that pressure symptoms are made evident by headache, nausea, and vomiting, vertigo toward the diseased side, mental and physical depression, marked lethargy, convulsions that may be attended with loss of consciousness, probably choked disk or optic neuritis, as well as reduced pulse rate and temperature. In a given case showing the above symptoms, especially when sudden in development and following a period of impaired health, we may be assured of the existence of an intracranial lesion. The point of vital importance is our ability to locate accurately the pus formation, since its prompt evacuation is the only means at our disposal offering relief. It is not sufficient to satisfy ourselves that a given region of the brain is involved, such as the cerebrum or cerebellum, but we should be able to designate definitely and finally the exact location of the lesion, as well as determine the amount of destruction incident thereto.

Brühl points out that in a lesion of the third frontal convolution, on the left side, we find agraphia and alexia; in lesions of the first temporal convolution on the left, word deafness, crossed deafness, and anosmia; of the occipital lobe, optic aphasia and hemiopia. When the lesion is situated around the fissure of Rolando, epileptiform convulsions and crossed paralysis of the extremities and facial paralysis are present. In lesions of the cerebellum, ataxia, vertigo, staggering gait, nystagmus, emaciation and rigidity of the muscles of the neck are manifested. These latter symptoms, taken in connection with the severe occipital pain increased by percussion, the marked vomiting, frequent yawning, and extreme prostration, together with the flexed limbs and upturned face, would seem to be characteristic of cerebellar abscess.

However, I have seen cases operated upon for cere-

bellar abscess, in which no pus was found, notwithstanding the fact that many of the above enumerated symptoms were present. In one case in particular, the post-mortem examination revealed the presence of non-infectious sinus thrombosis, the inflammatory condition extending to the meninges and brain tissue adjacent thereto. In this instance the symptoms showed that the lesion was located in the region of the cerebellum, but the interior of the cerebellar lobe was absolutely normal.

Briefly stated, the symptoms of brain abscess in general are as follows: Pain in the head is the earliest symptom, and at first is very severe, but later it becomes a steady, dull ache, and is present as long as the patient retains consciousness. It is increased if the cranium is percussed or pressure applied. At the beginning the patient has a high temperature, which soon drops to normal or sub-normal, but in case of rupture the absorption of toxin and the removal of pressure cause another sharp rise. When the temperature is highest, the pulse is usually rapid, but later it slows down and remains so until pressure is relieved by rupture of the abscess, when it again becomes rapid. Respirations are slow, deep, and stertorous. There will be cerebral or reflex vomiting, *i. e.*, emesis with a clean tongue, and not dependent on the ingestion of food. In the beginning the only ocular symptoms present will be photophobia, but later the pupil on the affected side becomes dilated and examination of the eyeground shows optic neuritis. Usually in advanced cases of brain abscess the patient is in a state of stupor, being hard to arouse, and only performs acts or answers questions after he has been spoken to several times, if indeed he can be aroused at all.

If the abscess is in the region of the Rolando fissure, certain muscular centres may be pressed upon, and thereby manifest its presence in the form of Jacksonian epilepsy. But cerebral abscesses of otic origin are seldom found in this region. Their location is usually

either in the temporo-sphenoidal lobe or in the cerebellum.

A great majority of these abscesses are found under what Barker calls the "dangerous area." This is within a circle having a radius of $1\frac{1}{4}$ inches, which has for its centre a point $1\frac{1}{4}$ inches above and behind the external auditory meatus. They are often found not directly in contact with their source of infection, but with about an inch of healthy brain tissue intervening,—this, of course, occurring when the infection is carried by the venous system.

It is sometimes noted that the local temperature is higher immediately over the seat of the abscess, even though the body temperature is subnormal. Macewen has found in some cases that in percussion of the head a higher note is elicited over the abscess than over the rest of the head.

A point of the greatest value, and one, furthermore, that explains the fatal termination of many cases that succumb after the pus has been evacuated, is the development of satellitic abscess formations, arising from the parent abscess cavity. These foci are usually separated from each other by a thin wall of healthy brain tissue. Here again, accurate localization would enable us to determine definitely the situation of additional metastatic pus areas.

W. Milligan¹ states that the "occurrence of sensory aphasia is a symptom in cases in which a pathologic lesion is situated in the temporo-sphenoidal convolution; of motor aphasia, when the lesion is in the third left frontal convolution, or when pressure, say from an adjoining temporo-sphenoidal abscess, is exerted upon this centre; of twitching paresis or paralysis of various muscles or groups of muscles, when the cortical centre which controls these muscles is interfered with, either as the result of an irritative and spreading meningitis

¹ *British Med. Jour.*, Oct. 22, 1898.

or as the result of the pressure of a gradually increasing focus of suppuration." Hemiplegia signifies that the contents of the abscess press upon the internal capsule. Involvement of the third nerve is a symptom of temporo-sphenoidal abscess; sometimes the sixth nerve is involved in the same lesion. In cerebellar abscess we sometimes find optic neuritis followed by atrophy. An uncomplicated otitic cerebral lesion is not difficult to diagnose, but when one or more lesions occur together, then symptoms of one overlap or mask those of the other.

Gradenigo¹ draws attention to the fact that encephalic abscess consecutive to purulent middle-ear otitides are situated either in the temporo-sphenoidal convolutions or in the lateral lobe of the cerebellum, and in both instances are near the diseased temporal bone. Up to the present time the same description of symptoms has been applied to the two kinds of abscesses. Nevertheless, the pathogenic, anatomic, and therapeutic differences that exist between the two forms of encephalic abscess justify a special description of each. Gradenigo then proceeds to describe the symptom of otitic cerebellar abscess: "Cerebellar abscess is less directly in relation with osseous lesions than cerebral lesions. Infection is conveyed to the cerebellum either by the sigmoid fossa or by the labyrinth through the internal auditory canal. With cerebral abscess there often co-exists sinus thrombosis or lepto-meningitis. Differential diagnosis of these lesions is most difficult. Neither optic neuritis, lateral nystagmus, vertigo, nor rigidity of the nucha is a special symptom of cerebellar abscess."

When blood counts were first made to determine the presence or absence of severe infection, leucocytosis was the all-governing factor, but more careful study, with numerous observations, has shown that a differential count must be made and that leucocytosis is more an

¹ *Ann. des mal. de l'oreille*, Sept., 1898.

index of body resistance to infection than of its severity.

For example, a person with good resistance may have a marked leucocytosis as the result of a slight infection, and, on the other hand, a person with impaired resistance may have little or no increase in the number of white cells with a very severe infection.

The relative number of polynuclear leucocytes is of the greatest significance in the determination of the presence of a purulent or gangrenous process. The normal percentage of these cells varies between 59 per cent. and 68 per cent., with an average of about 61 per cent. If there is a relative count of less than 70 per cent., no pus need be suspected. Pus is not common with less than 80 per cent., except in children, where it has been found with a count as low as 73 per cent. About 93 per cent. indicates a very severe process, and when it reaches 95 per cent. it may be considered almost fatal.

Fowler¹ cites two very interesting cases:

CASE 1. A young woman with serious otitis media had pain, rapid pulse, temperature, etc., indicative of acute mastoid disease, but as the polynuclear cells reached only 59.7 per cent., operative procedure was deferred and the patient recovered without operation.

CASE 2. A young man recovering from mastoid involvement as a result of an acute purulent otitis media, for which he had been operated upon, began to show evidence of meningeal irritation, with only slight inflammation, except that the polynuclear cells were up to 82.3 per cent. Operation disclosed a large abscess, and the patient subsequently died from meningitis. In both of these cases the percentage of polynuclear cells was accepted as an index for or against surgical interference.

From these observations we reach the following conclusions:

First. A marked leucocytosis with a relative per-

¹ *Treatise of Surgery*, p. 255.

centage of polynuclear cells below 70, shows slight infection with good resistance.

Second. A marked leucocytosis with relative percentage of polynuclear cells above 80, shows severe infection with good body resistance.

Third. Slight or absent leucocytosis, with relative percentage of polynuclear cells above 80, shows severe infection with impaired resistance.

An interesting contribution on this subject by McKernon,¹ in which he reviews his findings in one hundred and sixty-six cases, confirms the value of the differential blood counts in septic cases.

I am indebted to Dr. J. Chalmers Da Costa for the following notes:

"That an abscess may cause focal symptoms is undoubtedly true, but in some regions it never does; and in some instances when situated in a region in which one would expect it to, it does not do so. The diagnosis may rest to a very large degree upon a history of injury; the existence of some suppurating condition, particularly about the head or face; or the presence of some bacterial disease. When a person suffering with one of these conditions develops headache, slowed pulse, vomiting, irregular or subnormal temperature, and stupor, there is infection within the cranial cavity, which may be due to meningitis and may be due to abscess. If, in such a condition, there is evidence of localization of a process, the diagnosis of abscess is certain. Hence, focal symptoms should always be sought for, and are of the greatest possible value when found."

Abscess in or near the motor cortex may produce spasms, as a brain tumor does; but Mills points out that spasms are less frequent in abscess than in brain tumor, and even if present, do not have "such definite initial or signal symptoms." Of course the focal symptoms, if

¹ *N. Y. Med. Jour.*, Jan. 19, 1907.

they exist, vary with the situation of the abscess, its size, the regions into which it passes, and its association with purulent meningitis. In ear disease, the abscess is usually found in the temporo-sphenoidal lobe; and in that case it is occasionally found that there is loss of power on the opposite side of the body. This symptom may confuse us, and lead us to believe that an abscess is not in the temporo-sphenoidal lobe. When this condition is met with, it results from "pressure upon the fronto-parietal region, across the Sylvian fossa" (Mills). An abscess in the temporal region of the left side may cause word-deafness or perhaps amnesic aphasia. So, too, the third nerve on the side of the abscess may occasionally exhibit the effects of pressure.

It is difficult, or impossible, to locate from symptoms the existence of an abscess in the frontal lobe. Abscess of the cerebellum may present definite cerebellar symptoms, and may induce focal symptoms; and it can readily be confused with tumor. If we are in doubt, and suppurative ear-disease exists, the chance is in favor of abscess rather than of tumor; but if there has been an injury of the head, the chance is probably more in favor of tumor than of abscess. The symptoms of tumor are more gradual in onset, and there is the absence of the temperature to indicate some suppurative process, which in cerebellar abscess is apt to be elevated in the beginning of the case and subsequently become normal or subnormal. Again, in tumor choke disk is much more frequent than it is in abscess.

I think it is a correct statement to say that whereas the localization even of tumors is made with great difficulty, the localization of abscesses is often more difficult still.

Francis T. Stewart¹ trephined two cases in which a diagnosis of abscess of the brain had been made, but failed to find pus. Both of these patients died, and one

¹ Personal communication.

proved to be a case of uræmia on post-mortem; autopsy was not obtained in the second case. He also saw several cases in which the surgeon failed to find pus, although diagnosed as abscesses. He also reported several cases in which pus was evacuated after the skull had been opened for other conditions and in which pus was not suspected. He also mentions another case in which an extradural abscess was evacuated and the patient died from a cerebral abscess. Another case which came under his observation was one of thrombosis of the lateral sinus which he drained, and in which an eminent neurologist subsequently made a diagnosis of abscess of the brain, owing to the persistence of symptoms, but in which the autopsy revealed no suppurative lesion other than that of the sinus.

Gardner¹ reports a case of abscess of the temporo-sphenoidal associated with aphasia, alexia, agraphia, and ptosis, which he explains by the fact that from the temporal lobe a band of associated fibres, which have to do with speech, proceeds to the frontal lobe, and a second band, a lesion of which causes alexia, extends to the occipital lobe.

Although an abscess of the temporo-sphenoidal lobe may be present and usually does exist for a period without producing definite symptoms, the following case, nevertheless, shows conclusively that pus confined within the temporo-sphenoidal lobe may suddenly produce symptoms closely simulating those of sinus thrombosis.

The patient, a man fifty-two years of age, suffered for the past forty-two years from the recurrent type of chronic otorrhœa, a sequela of measles; the intervals between the periods of aural discharge ranged from six weeks to four years. He was repeatedly advised not to have his ears treated, "as it might go to the brain," so he simply syringed the ear with weak soap suds whenever

¹ *Med. Record*, Aug. 3, 1901.

there was any discharge present. It is worthy of note that during the past two years his acute exacerbations were progressively more frequent and accompanied by severe pain over the mastoid and adjacent region.

The writer saw him during his last attack, it being unlike any of the former ones, and characterized by an abrupt cessation of the discharge, the temperature suddenly rising to 105.2° , with severe pain in and around the ear, being especially severe over the mastoid. He had severe chills, followed by marked remission in the temperature and severe sweating. Optic aphasia was well marked. These symptoms being characteristic of sinus thrombosis, an immediate operation was advised. Careful examination did not show the slightest evidence of jugular involvement. During the Stacke operation a moderate amount of necrotic bone was removed; the greater part of the process, as is usual in chronic cases, was exceedingly dense and difficult to remove. The bone covering the sinus was hard and apparently healthy, except in some few spots, where eburnation was not yet complete. Much to my surprise, the sinus, when exposed, proved to be entirely normal. The only point at which free pus was found was in the tympanic cavity and the mastoid antrum, and even there in very small quantity.

Further examination revealed a small carious opening through the tympanic roof, which, upon being enlarged, revealed a quantity of foul-smelling pus oozing through an inadequate opening in the dura. Both openings were then enlarged to provide proper drainage; a large probe was introduced through the fistulous opening which led into the temporo-sphenoidal lobe, and upon its withdrawal an additional quantity of pus escaped. Following this, the active symptoms promptly subsided, the patient making a slow but uninterrupted recovery. Bacon reports a case somewhat similar to the above.

The following interesting case came under the joint

care of Dr. Francis Stewart and myself, and illustrates our faulty methods of brain localization.

The patient, a Russian tailor, aged twenty-four years, was admitted to the Jefferson Hospital, October 21, 1906. His parents, three sisters, and four brothers are living and in good health, and there is no history of cardiac, renal, tuberculous, or malignant disease in the family. He never had any of the diseases of childhood, although at one time during infancy he was exposed to severe cold, which may have been the cause of his ear trouble. At any rate he has suffered from a recurrent suppurative otitis media of the left ear from early childhood, the discharge at times being profuse, offensive, and brownish-yellow in color.

About six years ago the discharge suddenly ceased, after exposure to severe inclement weather; pain and tenderness developed in the mastoid, together with redness and swelling of the overlying skin. The physician who was consulted at the time made an incision through the soft parts and evacuated a large quantity of foul-smelling pus, thus relieving the mastoid symptoms, but not apparently affecting the otorrhœa. The general health has always been good and no history of venereal infection could be obtained.

Present Trouble.—As nearly as can be learned, the patient had dull headache, malaise, and loss of appetite for two weeks prior to entrance to the hospital. Two days before admission the aural discharge disappeared rather abruptly, the left mastoid became tender and painful, and a dull unilateral (left-sided) headache developed. The following morning mental symptoms, chiefly of a homicidal nature, appeared, although the patient seemed quite rational at times. There has never been chill or vomiting.

On admission the patient was dull and apathetic, but not delirious, although very restless at times. The respirations were accelerated, the temperature 103° F., and the pulse 60. The bowels were constipated, and there was slight nausea. The unilateral headache was the only symptom which seemed to be annoying. The pupils were normal in size, equal, and reacting to light. The tongue was thickly coated, the breath foul, and the fauces slightly hyperæmic. The thoracic and

abdominal organs were apparently normal. The left auditory canal was narrow and blocked with thick, foul pus. The skin over the mastoid process showed the effects of a blister which was applied by the attending physician, and a slight depression due to the former operation. There was slight tenderness on deep pressure towards tip, but no distinct swelling or redness. Upon cleansing the auditory canal, abundant pus of a foul odor was encountered. The entire membrana tympani, as well as the ossicles, had been destroyed, and there was a distinct drooping of the superior and posterior wall of the external auditory canal, and a carious opening leading through the same and communicating with the mastoid cells. Examination of the eye grounds gave a negative result. The neurological examination was also negative, save for mental hebetude. The urine showed no abnormalities.

The radical operation was performed by the writer, Oct. 22, 1906. An old sinus was encountered above the mastoid, a little higher than the level of the auricle. There was some pus and much softened bone, removal of the latter necessitating exposure of a portion of the lateral sinus. After thoroughly curetting the middle-ear cavity, the old sinus was enlarged with the chisel, considerable pus being evacuated after reaching the dura. The abscess cavity lay in the temporo-sphenoidal lobe and comfortably admitted the index finger above the second joint. It was washed out with salt solution and return drainage tubes inserted. A few silkworm-gut stitches were then inserted above and below the exit of the tubes and the remaining space filled with gauze. After operation the head was elevated, stimulants administered, and elimination encouraged. Morphine hypodermically was needed on several occasions, as the patient was delirious and quite restless. Six days after this operation the patient again began to show signs of cerebral compression.

A second neurological report by Dr. A. Gordon is as follows :

"The patient presents marked mental hebetude. It is difficult to arouse him. At times he would clear up, and then it is possible to make him execute some acts necessary for examination. Simple acts he would perform, but with delay.

Complicated acts are not done by him because, I believe, of impaired comprehension. The physical symptoms are as follows: When told to raise his foot, he would first bend the leg over the thigh, and the thigh over the pelvis, and only then the foot. When told to raise his hand, he would first bend the forearm over the arm, and only then raise the entire limb. The phenomenon was present on both sides. The knee-jerk is exaggerated on the right and diminished on the left. There is a slight Babinski on the right, but a distinct paradoxical reflex on the left. No ankle-clonus on either side. The reflexes of the upper extremities are exaggerated. There is hyperalgesia in the lower extremities and hypalgesia in the upper. There is apparently no cranial nerve involvement, but this cannot be accepted as absolutely correct, as in view of his mental condition it was difficult to make the patient execute uniform movements at each test, either with his eyes or facial muscles. The tongue, however, protrudes to the right.

"In view of the irregularly distributed symptoms and chiefly because of the presence of the above phenomena in raising the foot or hand (asynergia), the cerebellum is probably involved."

The following day the pulse was 45, the temperature 97° F., and mental hebetude quite marked. As these symptoms increased during the following three days, exploration was decided upon.

Second Operation, by Francis T. Stewart. The original incision was separated and the opening in the skull enlarged. After exploring the abscess cavity with a negative result, the scalp incision was carried backwards and downwards, and the cerebellum exposed with gouge and rongeur. The cerebellum bulged into the opening, showing increased intracranial pressure, although the pulsation was quite evident, and no pus could be found with the needle and trocar, not even by an incision. The temporo-sphenoidal lobe was, therefore, again explored, and a satellite abscess, containing perhaps a dram of pus, discovered above and in front of the original abscess cavity, apparently separated from the parent abscess by a very thin wall of healthy brain tissue. A double drainage tube was inserted into this through the original cavity, and

iodoform gauze placed over the cerebellum. Following the operation, the patient's condition was very poor, and he was given vigorous stimulation and saline infusion.

The following day (Nov. 2, 1906), somnolency was marked, but the general condition somewhat better; rectal feeding was necessary.

(Nov. 4, 1906.) He answered when spoken to for the first time since the second operation, and took food by mouth. The pulse was quite weak. The patient was extremely restless at times, and was unable to recognize his surroundings.

(Nov. 5, 1906.) Fed through nose and by nutrient enemata. A little weaker.

(Nov. 7, 1906.) Condition same.

(Nov. 8, 1906.) Unable to speak, but noticed when spoken to. Hypodermoclysis. Sudden elevation of temperature.

(Nov. 9, 1906.) Slightly better circulation.

(Nov. 10, 1906.) Decline of temperature. Spoke some. Much clearer mentally.

(Nov. 12, 1906.) Much improved. Answers questions. Wound discharge free and still foul.

(Nov. 14, 1906.) Some slight signs of compression. Tubes carefully cleaned, and by Nov. 15, 1906, patient much improved.

(Nov. 20, 1906.) Patient got out of bed and walked about eight feet.

(Nov. 23, 1906 to Nov. 26, 1906.) Patient irritable and noisy.

(Nov. 26, 1906.) Morphine and hyoscine resorted to.

(Nov. 27, 1906.) Patient clearer than ever before. Was able to tell and spell his name, spoke of business, etc.

The patient left the hospital about the middle of December and was seen only a few days ago, and has improved markedly, both mentally and physically, being able to return to work.

In conclusion I wish to remind you that in the foregoing interesting case, with the exception of the otorrhœa, there was an entire absence of diagnostic symptoms suggesting either the nature of the brain lesion or its location. Had it not been for the fact that an old sinus was discovered,

we would have been in absolute ignorance as to the exact location of the pus formation. Furthermore, had the temporo-sphenoidal lobe been explored in the usual way, it is unlikely that all the pus would have been evacuated, from the fact that satellite abscess formation had already formed.

There was also an entire absence of either chill or vomiting.

Repeated examinations of the eye ground gave negative results, while the neurological examinations were of little or no diagnostic value.

REPORT OF THE FIFTEENTH MEETING OF THE
GERMAN OTOLOGICAL SOCIETY HELD
AT VIENNA, JUNE 1 AND 2, 1906

BY DR. SCHROEDER, ERLANGEN.

Translated by Dr. PERCY FRIDENBERG, New York.

HINSBERG (Breslau) on **labyrinth suppuration** reports statistics agreeing with those of Friedrich. Labyrinthine suppuration occurs once in each one hundred cases of purulent middle-ear disease, so that it is more frequent than all the intracranial complications (meningitis, brain-abscess, sinus-thrombosis) combined. The labyrinth also affords a path of infection for the meninges, and for about half the cases of cerebellar abscess. Males are more often affected than females (33.3, Breslau Policlinic). The affection is usually unilateral. After a consideration of the theoretical possibilities in infection of the labyrinth, the reader of the paper called attention to the following two paths as of practical importance from the standpoint of aural surgery.

1. From the middle ear, only after destruction of the bony wall of the labyrinth at some point:

(a) By injury.

(b) By inflammatory processes.

2. By way of the posterior surface of the petrous portion after rupture of a deep-seated extradural abscess.

In regard to the first form, the most important injury which may occasion labyrinthine suppuration is a fracture of the base of the skull. Injuries of the labyrinth by projectiles or foreign bodies introduced through the external meatus are less apt to be followed by this complication. In the case of foreign bodies there is generally an added element of injury by direct violence. Traumatic perforation of the

labyrinth may also occur at operation, intentionally or otherwise.

While the various forms already mentioned must be borne in mind, they are of slight etiologic importance compared with the suppurative processes. Acute otitis rarely leads to labyrinthine suppuration, if we except protracted cases, and those of scarlatinal panotitis in which arrosion of the labyrinthine capsule is not at all uncommon. Of chronic forms, cholesteatoma and tuberculosis are most apt to destroy the inner wall of the tympanic cavity and antrum. While perforation may take place at any point, it shows a preference for the two fenestra, the promontory, and the ampulla of the horizontal semicircular canal. In regard to fistulæ of the semicircular canal, the reader agreed with Friedrich, Kuemmel, and Goerke, that they are of minor importance as paths of labyrinthine infection. On the contrary, the most frequent point of perforation is the fenestra ovalis, then the secondary tympanic membrane, and finally the promontory. Several "fistulæ" are often found together. Multiple fistulæ, however, are seen rather frequently when pus breaks through from within outward. In the course of an otitis media purulenta a deep-seated extradural abscess may develop over the posterior surface of the petrous portion. The suppuration may now spread, by arrosion of the posterior or upper semicircular canal, to the labyrinth itself. (Cases of Jansen, Habermann, and of the speaker.) Hinsberg then discussed the development of fistulæ of the semicircular canals, drawing a distinction between primary fistulæ, caused by pus penetrating into the depths, and secondary fistulæ, by perforation, from within outward, of pus which had entered the labyrinth by some path or other.

In case of purulent perforation of the round window, the foot-plate of the stapes is either completely destroyed or perforated, or the annular ligament is more or less completely disintegrated.

Perforation of the oval window and at the promontory can usually be detected microscopically, after removing the granulations, while perforations of the round window can never be seen with the naked eye. Destruction of the inner

wall of the tympanum is usually due to caries, rarely to necrosis, although the latter change may occur, particularly at the ampulla of the semicircular canals.

The spread of infection to the labyrinth depends on the path and nature of the infecting agent, its virulence, the natural protective powers of the organism, the location of the perforation, and, last but not least, the more or less favorable opportunities for drainage and escape of the pus. Thus we may have diffuse or localized labyrinthine suppuration, the latter more commonly in case there has been a reactive inflammation with the formation of adhesions of a protective nature which may prevent the spread of the suppuration for a time or even permanently. The last possibility seems to be given most frequently by a cholesteatoma. The tissue changes in the labyrinth are generally most marked at the point of entrance of the pus; *e. g.*, in case of perforation through the oval window, in the vestibule and the scala vestibuli; in case of perforation through the membrana tympani secundaria, in the scala tympani. The changes may spread continuously from the port of infection or may skip certain sections of the inner ear. The latter condition is noted quite frequently in suppuration following fracture of the base.

The reader of the paper then discussed the ways by which suppuration may reach the cranial cavity from the interior of the labyrinth. This may take place by pre-formed paths, or the pus may make its way by arrosion of the capsule of the labyrinth at any point, but most frequently, of the upper or posterior semicircular canal. The pre-formed paths are:

1. Spontaneous dehiscences over the eminences for the posterior or upper canal (very rare; one case of Dunn's).
2. The acoustic nerve.
3. The aqueducts.

Infection by way of the aquæductus cochleæ seems to be more common than was formerly believed. In case of infection through the aquæductus vestibuli, an empyema develops in the saccus endolymphaticus. The latter form of infection has now been reported in twenty-five cases. Boesch claims that it would occur still more often but that the narrow bony canal is generally occluded by a barrier of granulation tissue.

Empyema of the endolymphatic sac leads in a few rare cases to a rapid destruction of the cerebral wall and stormy meningitis. Generally, however, the affection runs so slow a course that there is plenty of time for adhesions to form about the sac. Diffuse meningitis is thus prevented, while cerebellar abscess is a frequent result (59 per cent. of Boesch's cases) and this leads to secondary involvement of the meninges.

The reader then discussed in detail the path of infection through the aquæductus cochleæ and the nerve channels.

All paths described and hitherto reported lead to the posterior cranial fossa. This should always be borne in mind and special attention paid to the cerebellar fossa on the development of even slight cerebral symptoms in the presence of a recognized labyrinthine affection.

In order to understand the symptoms of inner-ear suppuration, we must bear in mind that this section contains not only the auditory organ but that of static equilibrium as well, and that each of these organs may present positive or negative symptoms depending on irritation and on loss of function, respectively. Irritation of the terminal elements in the cochlea causes subjective sensations of sound, that of the vestibular and canalicular system, vertigo, disturbances of equilibrium, nystagmus, nausea, and vomiting. Destruction of the terminal elements in the labyrinth causes deafness when the cochlea is involved, and, when the ampullar nerve-endings are affected, disturbance of equilibrium, *without* vertigo or nystagmus. These data make it easy to understand the clinical picture of labyrinthine suppuration, particularly of the manifest forms, but the relation between symptoms and pathologic changes is not yet cleared up. Symptoms of irritation may depend, as Jansen has pointed out, on a combination of anatomic changes and increase of intralabyrinthine pressure. Hinsberg then described the symptoms as we see them at the bedside; the vertigo, the nystagmus, the nausea and vomiting; then subjective sensations due to irritation, and the negative symptoms due to loss of function of the cochlea. There is little or no fever in uncomplicated cases of labyrinthitis. A rise of temperature usually means that bacteria or toxines have advanced along the nerves or through the aqueducts into the cranial cavity, and have

produced cerebral complication. Changes in the optic nerve-head, paralysis of the abducens, and slowing of the pulse are very improbable in uncomplicated labyrinthitis. The influence of inner-ear suppuration on the pupil has not yet been explained. In discussing the course and termination of labyrinthine suppuration, Hinsberg mentioned the factors which predispose to a sudden extension of the purulent process to the interior of the cranium, even in latent cases. One such factor is the retention of pus in the middle ear. In case a direct communication is present, this of course leads to damming up of pus in the labyrinth. Neglected otitis with marked formation of granulations, infection, or swelling up of cholesteatoma, extraction or cauterization of polypi may lead to such occurrences. These factors are not the most common. Usually we see after some major operation in aural surgery a sudden development of acute meningitis in a patient who was apparently in good health except, of course, for the local affection. We know now that at least in one half of these cases an unrecognized latent labyrinthitis was the connecting link. Statistics were submitted by H. showing the danger of major operations.

In the diagnosis, static and dynamic tests of equilibrium and careful tests of hearing are important. The methods recommended by Bezold are to be carried out. This must be completed by laying open the middle ear and carefully inspecting the wall of the labyrinth for fistulæ or translucent spots in the canal walls. H. also deprecates any fear of the region of the oval window, and shows how this region can be attacked without danger to the patient. The same thing holds true for the promontory and the round window.

Basing on the functional examination before operation in connection with the conditions found during operation in the labyrinth wall, H. distinguishes the following types of disease:

1. Diffuse labyrinthine suppuration. Symptoms:

(a) Before operation:

Deafness and evident irritative or defective phenomena in the apparatus of equilibrium.

(b) During operation:

Defect of the stapes, possibly complicated with fistula of the semicircular canal.

2. Localized disease of the semicircular canal. Symptoms:

(a) Before operation:

Symptoms of irritation with comparatively good hearing.

(b) During operation:

Fistula of the semicircular canal. (Stapes preserved.)

or

(a) Before operation:

No irritative or defective symptoms, with comparatively good hearing.

(b) During operation:

Fistula of the semicircular canal.

Finally there are cases of labyrinthine irritation in which no infection has taken place. The details must be read in the original paper. In the differential diagnosis of cerebellar abscess and labyrinthine suppuration, H. gives a number of new and important points. The mortality reported by various authors varies from 25 to 86 per cent. In diffuse otitis interna, according to H., it is at least 15-20 per cent.

As to **treatment**, the first consideration is to give free egress to the products of inflammation pent up in the inner ear, and to prevent re-infection from the purulent focus in the middle ear. To effect this, H. claims that it is necessary to open up the cavities of the labyrinth as widely as possible from the middle ear. A statistical résumé of the cases in which this postulate was met shows that the mortality has already been reduced to 4.2 per cent. H. discusses in detail the indications for immediate operation and for temporizing. The operative technique is described with relation to topographical landmarks. H. at first followed Jansen's method, but has now devised an original procedure, starting at the oval window. Neumann's method is considered the best for a number of cases in which there is a complication with deep extradural or cerebellar abscess. During operation it is well to watch for an escape of cerebro-spinal fluid. H. has never seen any fluid in case of diffuse involvement of the labyrinth while it is invariably met with when a normal inner ear is laid open wide. Healing takes place from the depths

by granulation and epidermization. Operated cases invariably show complete deafness and symptoms of defect in the static apparatus.

Discussion: HERZOG (Munich) has for the past year examined the ears of every patient admitted to the hospital for **pulmonary tuberculosis**. He found that of 100 tuberculous males, seventeen were affected with chronic otitis media purulenta, twenty-one ears in all. In six of these suppurating ears, functional tests showed deafness (labyrinthine involvement); in three cases this deafness had developed while the patient was under observation. The six ears represented five patients, so that 5 per cent. of the tuberculous males had labyrinthine suppuration. One of these cases is reported in detail on account of the unusual course in regard to functional examination. The patient was forty-three years of age, and affected with advanced phthisis. There was a double otitis media with tubercle bacilli in the discharge. The left ear was completely deaf; the right ear could distinguish a whisper at 5cm. Accompanying bone disease necessitated opening the mastoid on the right side. Four months after the operation, this ear also became completely deaf. A little while later, and this is the surprising feature of the case, remnants of hearing began to reappear in this ear, which had been unquestionably and completely deaf. These traces appeared as islands in the field of audition, as it were, so that there were at first defects, but after a time there was a continuous normal stretch from the small octave to nearly the normal upper-tone limit. During the entire time of observation there was no evidence subjective or objective of disturbance of the vestibular apparatus, but during the removal of the sequestrum, noted above, it was remarked that each time the horizontal canal was touched, there was marked nystagmus. This case came to autopsy, and the post-mortem finding in connection with the clinical data led to the assumption of a perforation of the pus from the middle ear into the labyrinth through the region of the promontory.

KUEMMEL (Hamburg) analyzed the data submitted by Hinsberg, and cannot admit that labyrinthine involvement is specially frequent in tuberculous otitis media. In twenty-six cases operated by him, tuberculous labyrinthitis was

found in six. Of these, three were a special type of "necrosing" tuberculosis. Careful histologic examination would probably show tuberculosis to be a factor in a still larger percentage of sequester formation in the labyrinth. Necrosis in tuberculous otitis presents a typical clinical picture in children. One sequestrum after the other is cast off, so that the entire petrous portion may be extruded. In many of his cases K. had the impression, at first, that they would run a favorable course, but eventually all of them died of meningitis. In all cases of rapid extensive destruction of the labyrinth tuberculous changes should be looked for with extreme care.

PANSE (Dresden) lays stress on the necessity and possibility of recognizing an affection of various parts of the labyrinth, and presented microscopic specimens in support of this contention. He submitted a diagram for uniform use, and advised careful histological examination of as large a number as possible of auditory and equilibrium organs which had been tested functionally *intra vitam*.

V. FRANKL-HOCHWART thinks it of importance to consider the occupation of the patient, and to ask what motions are usually made, and which now are difficult or cause vertigo.

SCHEIBE (Munich) notes that vertigo is very unusual and very slight in tuberculous affections of the inner ear.

HEINE (Koenigsberg) presented a statistical report from Lucae's clinic in Berlin. In 277 cases seen, there was a mortality of 8.3 per cent.

PASSOW (Berlin) reported post-mortem findings which were of great importance for a further study of the paths of infection from the labyrinth to the meninges. Macroscopically, a typical empyema of the saccus endolymphaticus was made out. Microscopic examination showed quite unexpectedly, that the aquæductus vestibuli and the saccus were free, and that an extradural abscess had simulated a pus-accumulation in the sac. It appears, accordingly, that the diagnosis of empyema of the saccus endolymphaticus can only be made with certainty on the basis of a microscopic examination.

BRIEGER (Breslau) found isolated fistulæ of the semicircular canals in only very few instances. Translucent spots may occur in perfectly normal cases. He agrees with Kuemmel as

to the frequency of tuberculosis as a factor in labyrinthine suppuration.

POLITZER (Vienna) remarked that labyrinthine suppuration may extend to the peripheral portion of the auditory nerve, and may even then become limited by demarcation. The meatus auditorius internus must accordingly be considered in labyrinth operations.

HABERMANN (Graz) reported a case of perforation through the oval window with loosening of the foot-plate of the stapes. Functional examination showed that such a loosening may cause a marked increase in the bone-condition.

SCHOENEMANN (Berne) discussed the embryology of the labyrinth and its development, particularly in regard to topography.

PANSE (Dresden) repeated his views as to the rarity of fistulæ of the semicircular canals, which, when they do occur, are prognostically favorable.

GOERKE (Breslau) thinks macroscopic examination must be superseded more and more by careful histological investigation. He has observed an undoubted case of empyema of the sacculus which was then demonstrated. His investigations show that pus rarely makes its way through dehiscences.

Voss (Berlin) presents statistics of nineteen cases seen at the Charité.

ALT (Vienna) reports a case in which the degenerated facial nerve came out with a sequestrum. He will attempt to restore the function of the nerve by operative anastomosis with the hypoglossus.

NEUMANN (Vienna) presents the present standpoint of the Vienna school (Poltzer) in regard to operation in labyrinthine involvement. As soon as suppuration has been determined beyond a doubt, the radical operation is performed in every case. The question whether to open the labyrinth at this time or to temporize, is decided by the conditions found at operation (fistula), and by the condition of the labyrinth, functionally, as determined by tests before operation.

BARANY (Vienna) describes in detail the methods used in Poltzer's clinic to determine the condition of the vestibular apparatus. Syringing with water at different temperatures (test for "caloric nystagmus") was the most reliable method.

HABERMANN (Graz) believes syringing, particularly with cold water, to be rather dangerous.

DENKER (Erlangen) raises the same objection to the hopping test which shakes the patient up seriously and may cause trouble.

WANNER (Munich) alludes to the danger of tests in which forced turning is used.

BRIEGER mentions a method of getting footprints in case of suspected ataxia or disturbance of equilibrium. The soles of the patient's feet are painted with 5 per cent. solution of ferro-cyanide and he then walks on a strip of linen impregnated with liquor ferri.

BARANY (Vienna) demonstrated an apparatus to examine abnormal rotation of the eyes.

In the discussion on **operative technique**, attention was called by Kuemmel to the marked tendency of the labyrinth to heal up. Bearing this in mind it is important to make a sufficient breach in the round window and in the anterior portion of the cochlea. Newly forming pus then escapes of its own accord and spontaneous healing can take place.

NEUMANN (Vienna) lays stress on the rapid healing made possible by his method. Complete epidermization takes place in eight weeks. On the other hand, when the labyrinth is opened from the tympanic side, danger to life is removed, it is true, but the patient is exposed to a long convalescence which may last for a year or more, before complete healing takes place.

DENKER (Erlangen). Demonstration of a new method of **operation for malignant tumors of the nose**. Almost all previous methods require a solution of continuity of the skin of the face, and are followed by more or less disfigurement. This procedure is entirely sub-mucous. The steps are as follows: Horizontal incision through the mucous membrane, 1cm above the margin of the gum, beginning above the wisdom tooth, and extending forward to and about 1cm beyond the frenulum, then turning upward to the margin of the pyriform aperture. The soft tissues are then pushed back with a periosteal elevator as far as the lower orbital margin, so that the facial surface of the superior maxilla, including the aperture pyriformis is exposed. Beginning at the margin

of the latter aperture, the mucous membrane of the lateral wall of the lower and middle meatus is lifted off blunt, and the inferior turbinate separated from the bony crest with strong scissors. The facial wall of the antrum is now resected, and the cavity cleaned out if necessary, with removal of the lateral wall of the nose. Up to this point it is possible to prevent the entrance of blood from the field of operation into the nasal cavity almost completely. The remaining mucous membrane of the lateral wall of the nose is now removed rapidly together with the tumor, the ethmoidal cells are cleaned out, and the sphenoidal sinus opened. A tampon of vioform gauze is then inserted and the oral wound closed. After-treatment, through the nose. If the field of operation be thoroughly exposed it is possible to avoid all danger of aspiration pneumonia and all disfigurement.

ZIMMERMANN (Dresden) on the **physiology of tone conduction.**

Z. opposes the general view that the percipient fibres receive their final impulse and stimulation from the labyrinthine fluid only, and that the enclosing bony structures are not adapted to the transmission of sounds. The deductions of Boenninghaus from the conditions found in the ear of the whale are not well grounded. In transmission of sounds we have to deal only with purely molecular motion, which, as such, causes no motion of one bone on another or of one bone in regard to another in which it is enclosed. It can be shown that the ossicular chain is not moved any more at the footplate than is the bone of the promontory. The labyrinth water is practically nothing but imbedding fluid and has nothing to do with the conduction of sound, certainly not, as Bezold says, in the sense of a spiral motion from one fenestra to the other. The fluid does, however, allow the finest variations of intralabyrinthine pressure. Each increase of hydrostatic pressure causes a damping, not a stimulation, of the oscillation of the fibres.

V. FRANKL-HOCHWART reviewed the subject of **Ménière's vertigo.**

The classical attack is to be distinguished from accessory vertigo developing in the course of a previous otitis media or labyrinthine otitis, less frequently in affection of the auditory

nerve or in external otitis. Attacks simulating Ménière's disease are also seen coming on in paroxysms with an intact ear, as an aura of an hysterical or epileptic seizure. The classical attack is characterized by fearful rotary vertigo, disturbance of hearing, troublesome tinnitus, ataxia, nystagmus, and vomiting. Vasomotor disturbances are a frequent complication, as are also anomalies of the pulse, diarrhoea, fright, and headache. Between the paroxysms there may be no symptoms except the deafness, although occasionally slight ataxia and nystagmus are observed. The recognition of Ménière's apoplexy with severe disturbances of consciousness, paralyses, and so on, is usually easy, although just in these cases sudden deafness is usually not found.

It is much more difficult to recognize the vertigo occurring as an aura in the accessory forms, especially if the patient be seen when free from the paroxysm. The ears should be carefully examined in every case, particularly every medical case, complaining of vertigo. If there is no disturbance of hearing, vestibular vertigo is very improbable, if not entirely out of the question. In case of deafness, there is always suspicion of vertigo ex aure læsa.

The vertigo observed in cases of oculomotor paralysis, in acute infectious diseases and in syphilis has little resemblance to Ménière's. In a certain class of gastric cases there is possibility of confusion on account of the violent vomiting. In arterio-sclerosis, deafness is not uncommon and the diagnosis may be obscured. In actual cerebral disease such as hemorrhage, softening, tumor, abscess, there is less difficulty in making a differential diagnosis as these affections even when they involve the auditory nerve rarely cause typical rotary vertigo with tinnitus. True paroxysms may occur in locomotor ataxia if the labyrinth and nerve are involved. The reader also referred to a symptom-complex first described by him, that of polyneuritis cerebrealis Ménièreiformis. The acute onset of this affection, the occurrence of herpes and of complete facial paralysis, together with the nervous disturbance of hearing, tinnitus, and rotary vertigo, assure the diagnosis.

Neurasthenic vertigo is differentiated from the aural form by the fact that it is rarely a typical rotary vertigo, the

patients do not have to lie down, do not collapse, and tinnitus and vomiting are absent. In cases of hysteria and epilepsy, the diagnosis is more difficult, and just in these cases it is that we meet with a pseudo-Ménière as understood by v. Frankl-Hochwart, *i. e.*, rotary vertigo, tinnitus, and vomiting. The negative finding in regard to the ear, and the occurrence of symptoms characteristic of these two neuroses (loss of consciousness, convulsions, incontinence, etc.) generally clear up the diagnosis. This is most difficult in the cases of so-called "formes frustes" of Ménière's disease. The most peculiar are the forms without disturbance of hearing. The fact that there is an aural lesion can be determined only by the most careful examination with a series of tuning-forks. Even when the ears are quite normal, and the patients not neurotic, the reader is inclined to make an occasional diagnosis of vestibular vertigo, assuming that this apparatus may become affected independently of, or earlier than, the cochlea. He has also seen a number of cases of vertigo without tinnitus, and calls attention, finally to the fact that there are "equivalents" of a severe attack of Ménière's in which rotary vertigo is replaced by a feeling of unsteadiness and of reeling which may be very slight. In fact, at times there may be only pressure-sensation over the vertex and temporary obscuration of vision, without any actual dizziness whatever. As to the prognosis of Ménière's vertigo, about 50 per cent. recover from the vertigo—that is, the deafness is always lasting or even progressive.

BRUEHL (Berlin): Contribution to the **pathological anatomy of the ear.**

The following specimens were demonstrated by the projection apparatus:

1. A case of tabes with deafness. Degeneration in the nuclear region of the acusticus and marked atrophic changes in the cochlea, particularly in the spiral ganglion.
2. A case of ankylosis between the hammer and a carious incus; obliteration of the fossula of the fenestra cochleæ by connective tissue. Atrophy of the spiral ganglion and "enormously" high jugular fossa. Clinically, this case had been diagnosed as stapes-yanklosis with nervous deafness (hyperplastic, adhesive catarrh).

3. Sections through the cochlea in a case diagnosticated, *intra vitam*, as neural deafness. Finding: atrophy of the ganglion spirale and of the cochlear nerve, more marked in the first convolution of the cochlea.

4. Sections through the cochlea in the case of a blacksmith, diagnosticated, *intra vitam*, as occupational neural deafness. Finding: atrophy of the spiral ganglion and of the cochlear nerve. Loss of Corti's organ in the basal convolution.

NAGER (Breslau): Demonstration of microscopic specimens of the labyrinth and auditory nerve.

This consisted in a demonstration of sections of the diseased inner ear in cases of epidemic cerebro-spinal meningitis, tuberculosis, syphilis, and cholesteatoma; cases of deaf-mutism, congenital and acquired; the latter form in consequence of injury or meningitis. In cerebro-spinal meningitis the reader called attention to the fact established by Siebenmann, that the otitis interna is only a subordinate symptom of the complete malady. This is explained by the close connection between the labyrinthine spaces and the intradural space by means of the nerve-trunk and its lymphatic and vascular spaces, and the aquæductus cochleæ. By means of these paths of infection the interior of the labyrinth may easily participate in pathologic processes of the interior of the cranium in cases of cerebro-spinal meningitis.

PASSOW (Berlin): Variations in the image of the drum due to foreshortening, and the errors of the quadrant division.

The image of the drum membrane which we get in otoscopy does not correspond to actual conditions, but is distorted in proportion to the narrowness of the external canal, and in proportion to the parallelism of the plane of the drum with that of the upper wall. This fact is generally overlooked in practice and is hardly considered at all in the text-books. To demonstrate the actual conditions, P. has had a large number of drums drawn in situ, and then again after removal of the external canal. These drawings show that scars, perforations, deposits, and so on, have a quite different form and are situated in a different quadrant from what the otoscopic image would lead us to expect.

Further investigations showed that our customary division

of the membrana tympani into quadrants is particularly faulty in case of retraction of the malleus by morbid processes.

The division also fails to agree with the anatomic conditions and is untenable. Politzer's division into quadrants by means of a horizontal line through the umbo, and a vertical from the umbo to the periphery, gives a more correct arrangement. The present lack of correspondence should be corrected by practical measures, such as uniform instruction and comparison of the terms used in the publications dealing with this subject, to insure a correct nomenclature and uniform division of the quadrants of the drum.

V. SCHROETTER (Vienna), demonstrated a new **endoscopic tube**. The novel point of this instrument consists in the light being transmitted within its wall, to the point to be observed. This is accomplished by the use of uviol-glass. The tube, coated black on its inner surface, is enclosed in a second, silver tube. The source of illumination is a ring-shaped incandescent bulb, made of glass bent into a spiral and containing a carbon filament. A filament of osmium is now being used with success to prevent rapid heating. At a distance of $\frac{1}{2}$ -1 cm from the lower end of the light there is uniform illumination of the region to be examined.

BEHM (Vienna-Moedling): **On sound-measurement and acousto-technique.**

The reader explained the principles involved and demonstrated the following instruments:

1. A tuning-fork sonometer. This is used to determine and measure the aerial tone waves for a given pitch. By a change of the tuning-forks it may be used for note, and is extremely delicate.

2. A universal sonometer. This allows, among other things, the determination of the maxima and minima of sound in a given space. It is practically of great importance in medical tests of hearing. Tones and vowels can be accurately analysed and demonstrated with this instrument. A demonstration was given. An apparatus can be attached by means of which the vibrations and wave forms can be registered photographically. The demonstration was followed by an exhaustive consideration of the differences between physiologic strength of tone (acuteness of hearing)

and physical intensity of sound, the details of which must be consulted in the original publication.

GUTZMANN (Berlin), **On the significance of the sensation of vibration for the voice-production of deaf-mutes and the deaf.** To determine the differences of sensibility of the finger for vibrations, the reader had constructed an apparatus in which two tuning-forks, run by electricity, transmit their vibrations alternately to a drum. It was found after careful exclusion, as far as possible, of all sources of error, that by sense of touch the finger can distinguish, without much difficulty, the difference of full tones. The possibility of practising and developing the faculty of distinguishing between the various notes by vibratory sensation, in deaf-mutes and those hard of hearing would be of great value for the voice formations and speech. The sensation of vibration would give to those deficient in hearing the same control of the sound of their own voices that the normal individual gets from tone perception. To apply this method in practice, the speaker advised a comparison with normally hearing children of equal age as a paradigm in the first steps of developing the sense of speech and voice production for vibration sense. The first exercises should begin as early as possible, at all events before the usual age of entering school. In this way we would have some hope of bringing pitch, intensity, and production of the voice under the individual's control in the spontaneous speech of the deaf-mute. The final result would be a marked improvement in the quality of speech of these defectives.

Discussion: BARTH (Leipzig) has made investigations in this field and has arrived at somewhat different results.

BLAU (Goerlitz): **Experimental closure of the fenestra rotunda.**

Demonstration of Microscopic Specimens: The reader has continued his experiments on dogs and cats with the single modification of using wax-cement as a filling. Immediately after the bi-lateral operation the animals cease to react to any impressions of sound. Suppuration or exudation in the bulla, tympanic cavity, or labyrinth was never observed. Microscopically, the filling was found surrounded or infiltrated by small cells and connective tissue.

Cicatricial tissue was found in the basal portion of the cochlea. Adhesion of Reissner's membrane to the organ of Corti. Flaws, colloid degeneration, or complete disappearance of Corti's organ. After six months, the cochlear nerve was found markedly degenerated. Spiral Ganglion: This was found decreased in size to the point of almost complete atrophy.

BLAU (Goerlitz): **The form of the concha in the insane and criminal.** The reader has made comparative examinations of the external ear in 206 normal individuals, 210 insane, 243 prisoners, and 20 prostitutes. The principal result of the statistics which are given elsewhere in detail, is to show a marked preponderance of unusually large proportions, so that these classes have an external ear which is functionally more perfect in Schwalbe's sense than that of the normal individual.

GOERKE (Breslau): **1. Labyrinthine changes in cerebro-spinal meningitis.** The reader examined nineteen temporal bones by means of serial sections. In only two of these, of one and the same case, approximately normal conditions were found; in the other seventeen bones inflammatory changes of greater or less severity were found. The path of infection from the meninges to the labyrinth was found to be the aquæductus cochleæ in three cases, the auditory nerve in eleven cases, the aquæductus vestibuli, probably, in one case, while the remaining cases were doubtful. The pathologic changes in the labyrinth show a marked tendency to recovery. In many cases only isolated sections were affected, while other parts of the labyrinth remained entirely free. A perforation of the fenestra and extension through the tympanic opening to the middle ear were never observed. On the contrary, fibrous, thickened masses of exudation were invariably found upon the fenestra. In some cases, the inflammatory process was limited to the semicircular canals; in others to the cochlea, and in either case circumscribed involvement was frequently noted. It is of interest to note that in many of the cases in which new formation of connective tissue and bone was found in the cochlea, hearing was present in both ears until death.

Discussion: HABERMANN (Graz) claims that in every case

of severe cerebro-spinal meningitis, infection and the transmission of the inflammation to the labyrinth takes place solely through the aquæductus cochleæ. The clinical data which prove this are the acute onset of the disease, and the deafness which comes on the first day.

2. Demonstration of **microscopic specimens**:

(a) Empyema of the saccus endolymphaticus in a case of labyrinthine suppuration.

(b) Isolated fistula of the horizontal semicircular canal.

(c) Complete fibrous and osseous degeneration of the labyrinth in a case of tuberculosis.

HOELSCHER (Ulm). The speaker referred to the recent **widening of the field of surgical activity in otology and laryngology**. In aural surgery, the intra-cranial complications, the ligations in the cervical region, are the most important. In rhinology, the radical treatment of tumors of the nasal and accessory cavities, of the mouth and the major operations on the larynx, suggested themselves. These three specialties which are almost always combined in practice are destined, the reader thinks, to be completely separated from general surgery as a special surgery of the head and neck, so that cranial and cerebral disease of any surgical nature, and tumors of the neck, of any kind, will be operated by the otologist and laryngologist, respectively.

These views were combated by several speakers in the discussion which followed.

KIRCHNER (Wuerzburg): **An apparatus for operative exercises on the temporal bone**. The apparatus which was to have been demonstrated had not arrived, and was explained by means of drawings. It consists of an inclined plane, like a drawing board. The temporal bone is fastened within an opening at the middle of the board, and the latter is movable on hinges, so that the preparation may be brought into any position desired, corresponding to operations on drum, tympanic cavity, or mastoid, to be performed on the living subject.

SCHOENEMANN (Berne): Demonstration of **microscopic specimens** on the pathologic anatomy of **adenoid hypertrophy**.

The reader discussed the question whether the pharyngeal tonsil is to be considered as a product of a disease process or

as a protective organ of normal occurrence and teleologic justification. In case of a decision in the latter sense, we should have to deal in a more conservative manner than has been the case hitherto, with adenoid growths of the nasopharynx. The reader, however, reaches the opposite conclusion, principally on the basis afforded by specimens, demonstrated at the meeting, which show that the lymphocytes in the adenoid tissue do not merely migrate to the surface, without changing the epithelium, but actually *emigrate*, and produce decided histologic changes in the epithelium which result in its destruction. The impression is produced that this process is due to a destructive quality inherent in and peculiar to adenoid tissue. Other epithelial structures, such as glands, are exposed to a similar aggressive action of lymphadenoid tissue.

In support of his theories, the reader demonstrated specimens in which the excretory ducts and lobules of glands had been surrounded, penetrated, and finally destroyed by the proliferation of adenoid tissue.

SCHOENEMANN (Berne): The preservation of the **tone-transmitting apparatus in the radical operation**. A new procedure is described by means of which the middle ear can be thoroughly cleaned out, without sacrificing the ossicles. This S. has entitled the "conservative radical operation." The entire posterior half of the drum is removed by an incision running parallel with and directly behind the handle of the malleus. The section is then carried through the corresponding part of Shrapnell's membrane, and out along the postero-superior canal wall to near the external meatus. A small bent knife is then introduced into the attic, severing the ligamentous connections between the malleus and incus, on the one hand, and the outer attic wall and bony wall of the Rivinian fissure, respectively, on the other. The radical operation is then performed in the usual way. The preliminary operation just described makes it easy to remove the lateral wall of the attic, completely, without disturbing the topographic relations of the ossicular chain. Besides this functionally important factor, Schoenemann's operation has the advantage of simplifying the formation of a plastic flap for the external wound and facilitating the entrance into

the tympanic opening of the attic, by means of the preparatory incision along the canal wall and through the drum.

HABERMANN (Graz): **Occupational deafness.** (A continuation of investigations published in the *Archiv f. Ohrenh.*, vol. xxx.)

H. reports the results of clinical and histologic studies. The first comprise 107 cases, in which permanent deafness had been induced by continued action of loud noises. Careful hearing tests demonstrated the fact that perception of high tones was the first to suffer, and that the hearing never became so bad but that the whispered voice could be distinguished. The second part of the paper presented a careful clinical and histologic study of five cases, of which two had also suffered with arterio-sclerosis, one with acoustic neuritis due to meningitis, and two with tabes. In all these cases, an atrophy of the organ of Corti was found of a progressive nature and involving the nerves of the lamina spiralis, while the ganglion cells of the spiral canal were generally well preserved. In a number of cases, the posterior portion of the foot-plate of the stapes was displaced markedly inwards. A decided, although circumscribed atrophy and cyst-formation in the vascular stria, in the first two cases, is ascribed to the arterio-sclerosis present. In the other two cases, the round-cell infiltration of the nerve, and the stria (in one case) are considered due to the tabes. In one of these cases it is worth noting that, post mortem, a marked lymphocytic infiltration was found in the nerve branch of the posterior ampulla. This case had shown marked symptoms of vertigo with vomiting, and objects appeared to dance before the eyes.

BLOCH (Freiburg): **Deafness in retinitis pigmentosa.** Ophthalmologists note disturbances of hearing in as much as 20 per cent. of all cases of pigment degeneration of the retina. In otologic literature, on the other hand, only four cases have been reported, all by Moos, in Schwartze's handbook. The reader has so far made functional tests of the hearing in eight cases of retinitis pigmentosa. Without exception, he was able to detect a neural deafness, although this was at times exceedingly slight. With the exception of one case, probably complicated with hyperostosis of the labyrinth capsule (Politzer), and commencing ankylosis of the stapes,

the type was that of pure neural involvement. In the advanced cases there was a "concentric contraction" of the acoustic fields, analogous to the condition found in the visual organ. The conducting apparatus was invariably intact. In two cases, consanguinity of the parents was determined. In three cases there was a history of aural disease in blood relations. The reader pleads for careful observation of these cases by otologists.

KUEMMEL (Heidelberg): **Clinical and bacteriological studies in acute otitis media.** The reader has come to the conclusion that the present system of categories of acute otitis, introduced by v. Troeltsch, depending on the character of the exudation, cannot be maintained.

We have to distinguish:

(a) Simple tubal catarrh, characterized by a lack of actual inflammatory phenomena in the tympanic and accessory cavities, and by the sterility of the secretion.

(b) Inflammatory forms, which are:

1. Meso-tympanic otitis media.

In this form, the inflammation runs its course mainly or exclusively in the principal cavity of the middle ear ("Meso-tympanum"). There is no circumscribed bulging of the drum.

2. Epi-tympanic otitis media.

Here we have, first and foremost, an involvement of the secondary cavities. There is always external evidence of mastoid inflammation, and localized inflammation and bulging of the drum. On the pars tensa, these changes are invariably limited to the postero-superior quadrant. They are rarely seen in Shrapnell's membrane.

The prognosis of otitis media depends upon its type. Involvement of the mastoid structures is to be feared only in the epi-tympanic form. In this type, again, the most dangerous organisms are the streptococcus pyogenes and mucosus. The staphylococcus aureus, on the other hand, was found in fifty inoculations only in cases with a comparatively mild clinical course, although the germ was found to be very virulent in the laboratory control experiments. Operation was required only in the streptococcus otitides. In a single case there was mixed streptococcus and pneumococcus infection.

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Details are given as to the exact procedure followed in the inoculations, former bacteriologic findings, and the anatomical basis of the differentiation of the two forms, described above, of middle-ear inflammation. The preparation of a report on this subject, to be presented at the meeting of the Association next year, was assigned to Kuemmel.

HOFFMANN (Dresden): **Fever and its causes in otitic brain-abscess.** Whereas Leutert ascribes rapidly disappearing transitory fever in the course of brain-abscess to an accompanying serous meningitis, the reader believes such an evanescent rise of temperature with its symptoms to be due on the contrary to a purulent form of meningeal inflammation. This hypothesis is founded on the report of the clinical course of three carefully studied cases of brain-abscess, and more particularly on the character of the fluid drawn off by lumbar puncture.

WANNER (Munich): **A case illustrating the relations of tone- and speech-audition.** The following findings were made after functional test of hearing of the left ear of an adult patient. The tone-scale of sixteen double vibrations was heard up to G sharp in the middle octave. Then there was a defect extending to G in the third octave above the staff. From this point on, audition was normal, up to Galton 10.5. The deafness of the right ear was so complete, that there was no possibility of a transmission of sensation. In the defect of the left ear we notice a correspondence with that portion of the scale which is most important for the hearing of speech, according to Bezold, namely, $b'-g''$; this defect also corresponds to the portion of the scale in which we find the basal tones for all the vowels and all of the consonants excepting M, N, and R. As a matter of fact, the patient hears no vowels, and R alone, of all the consonants. This case accordingly proves that Bezold's claim that an ear is deaf for speech if it is unable to hear the unloaded a' tuning-fork by aerial conduction is correct, as well as the correctness of O. Wolff's determination of the pitch characteristic of the letter R.

REPORT OF THE TRANSACTIONS OF THE NEW YORK OTOLOGICAL SOCIETY.

BY DR. T. J. HARRIS, SECRETARY.

MEETING OF JANUARY 22, 1907. THE PRESIDENT, JOHN E. SHEPPARD, M.D., OCCUPIED THE CHAIR.

Dr. WHITING reported a case of **mastoiditis with 1.75 per cent. of sugar in the urine**. The patient was also a hæmophilic and had albumen and casts. Father and brother died of hemorrhage after operation. He was disinclined under these circumstances to operate, but the mastoiditis was so severe that operation was urgently demanded; this showed an epidural abscess in cerebellar fossa. It was done in eighteen minutes. Severe bleeding followed. Packing was carefully applied and then the flaps of the wound were closely coapted as for primary healing. A high saline with gelatine was given, also gelatine internally and antiscorbutic diet. Stitches removed next day. Fifth day, packing was removed; there was moderate bleeding. Patient made a good recovery.

Discussion.—Dr. PHILLIPS reported two cases operated on for mastoiditis which were complicated by diabetes. The first case was a woman of forty upon whom he had operated one week ago. No diabetes was suspected at the time of the operation, which had been performed on the day of her admission. After the operation, 10 per cent. of sugar was discovered. The operation lasted one hour and fifteen minutes and in its course the dura was exposed. The pain and vertigo still persisted and seemed to indicate an intracranial complication. The second case was a man of sixty who had suffered from mastoiditis for several weeks. A large external swelling was present. Operation showed extensive exposure of the dura and sinus. Sugar was discovered in his urine.

Although the operation had been performed a week ago there had been no rise of temperature since.

Dr. KENEFICK spoke of a boy upon whom he had operated some years ago for adenoids who died of hemorrhage. Inquiry showed that there was a clear hæmophilic history. He called attention to the fact that this disease was transmitted by the mother but that only males were subject to it.

Dr. PHILLIPS said in response to inquiry that he had been unable so far to obtain any previous history of diabetes in the case of the woman, and had as yet received no full report as to the condition of the urine.

Dr. GRUENING emphasized the importance of a complete urinary analysis before every operation, and he thought that the prognosis in operation in a case complicated by diabetes rested largely on the presence or absence of acetone and diacetic acid.

Dr. PHILLIPS reported a case operated for acute mastoiditis complicated by facial erysipelas. The pus from the ear discharge showed the pneumococcus. It had been his experience this winter to find that all the cases of mastoiditis on which he had operated which had pneumatic cells filled with granulations showed the pneumococcus in the secretion. The blood count here gave 14,000 leucocytes and 64 per cent. of polynuclear cells. The sinus was uncovered at a second operation undertaken five days later because the temperature did not fall. No granulations were seen on it but it was opened. A free flow of blood followed from both ends. Shortly after a facial erysipelas developed and the temperature fell but the patient began to have double vision. An examination of the eyes showed double choked disk and lateral nystagmus. The veins were dilated and the retinal arteries appeared large. The patient continued to improve and was discharged three weeks after the second operation. The eye symptoms still persist but show a slight improvement. The doctor was not satisfied whether the temperature was due to sinus disease or the erysipelas which later developed.

Discussion.—Dr. GRUENING did not think that choked disk was rare in sinus disease. He had operated once for sinus thrombosis because of the presence of this symptom. An unusual feature of this case was that the arteries

were enlarged. It is the veins that are wont to be enlarged.

Dr. GRUENING reported a case of operation for mastoiditis by the radical method complicated by erysipelas. A man of twenty-six who had suffered from a running ear for years suddenly developed acute otitis and mastoiditis, with a temperature of 105° and streptococcus in the pus. A prompt operation revealed an eburnated mastoid. In the course of the radical operation the roof of the attic was not involved. The next day the temperature continued together with chills. The sinus was exposed, and though free bleeding ensued, the jugular vein was tied and excised. Next day the temperature was 106° and erysipelas developed. This spread to the other side of the head and now the ear on that side had become involved, as well as the mastoid. He inquired if we are justified in operating in the presence of erysipelas.

Dr. WHITING had operated twice in presence of a general erysipelas which was so extensive as to cause excessive swelling of scalp; good recovery followed.

Dr. TOEPLITZ referred to a case of a child recently under his care where he had suspected a retro-pharyngeal abscess and where a short time later erysipelas developed.

Dr. RAE spoke of a case of double mastoiditis complicated with erysipelas where he had operated on both mastoids without any unfavorable results; also a case of mastoiditis with extensive erysipelas, temperature of 106° , where the operation was successful.

Dr. GRUENING said that recovery did not always follow in these cases and cited one of his own where erysipelas developed after operation and death occurred the fifth day from extension to the brain.

Dr. POOLEY remarked that an extension to the meninges was always possible.

The CHAIRMAN said that he had seen one such case.

Dr. PHILLIPS questioned the liability of the extension of erysipelas to the meninges. He could not agree that this was to be apprehended.

Dr. GRUENING replied that the streptococcus of the disease could involve all the organs and tissues of the body. We cannot prescribe its course.

Dr. TOEPLITZ referred to a radical operation followed by erysipelas and death from meningitis.

Dr. HASKIN spoke of a case of mastoid operation where erysipelas was diagnosed as developing on the fourth day. It was later conclusively shown that the real trouble was iodoform poisoning.

Dr. RAE remarked that we can exclude from such a diagnosis all pre-operative cases, for in these no iodoform had been used.

Dr. HARRIS gave a further report of the case of **sypilis of the inner ear** which he reported at the last meeting. Although as high as 360 grains of iodide of potash had been given daily, with 1 grain of salicylate of mercury every third day hypodermically, and muriate of pilocarpin in tea every night to the full physiologic limit, there had been no improvement in the tinnitus. The man could not sleep and was willing to submit to any treatment, operative or otherwise, which promised any relief.

Discussion.—Dr. GRUENING said that he had seen contraction of the muscles at the neck of the bladder from use of pilocarpin. He rarely gave more than one twelfth of a grain in the beginning.

Dr. DUEL had seen tenesmus follow its use.

Dr. GRUENING did not think on account of the fluctuations in the hearing that any operation was warranted.

Dr. DUEL reported a **fatal case of meningitis following an acute otitis media**, the result of the nasal douche. When first seen, there was very slight redness of Schrapnell's membrane; no real pain; normal temperature. The next day a slight bulging of Schrapnell's membrane made him decide to open it under gas. Streptococci were found present in the blood secretion which followed the incision. There was a slight rise of temperature, but the patient complained of only a little discomfort in the ear; a gauze wick was introduced in the canal. The following day there was no increased mastoid tenderness. Hot irrigation was substituted for the gauze wick. Blood examination gave a polynuclear count of 75 per cent.; 23,000 whites. During the next day polynuclear count 86 per cent.; 43,000 whites. There was a slight rise in temperature. On the day after (the fifth day of the

disease) he suddenly became unconscious and died three hours later. A large quantity of sugar was discovered in the urine. Spinal puncture showed streptococci and pus.

Discussion.—Dr. LUTZ spoke of a similar case which he had seen. The patient had been in the ocean bathing. The following day the ear began to pain and discharge. Delirium followed on the second day and death.

Dr. HARRIS mentioned a case of meningitis in a man of twenty-five which resulted fatally on the fourth day. There was no involvement of the mastoid, which was opened. The only symptom complained of was intense pain in the ear. There was no bulging of the drum. An early opening of the drum had been practised.

REPORT OF THE TRANSACTIONS OF THE SECTION
IN OTOTOLOGY OF THE NEW YORK
ACADEMY OF MEDICINE.

REGULAR MEETING, NOVEMBER 8, 1906 (CONCLUDED), DR.
GRUENING IN THE CHAIR.

A case of syphilitic mastoiditis, presented by L. M. HURD,
M.D.

The patient, a little girl of four years, had her adenoids removed December 18, 1905. Three days later she complained of earache followed by a purulent discharge and a painful swelling over the mastoid process. The patient was seen June 6, 1906, when the following condition was found: Profuse purulent middle-ear discharge with tenderness over the antrum and a fluctuating tenderness back of the tender spot about the region of the sigmoid sinus. The nose was discharging muco-pus freely. Temperature 100°. The patient was operated upon that afternoon. The fluctuating swelling contained pus and was situated between the connective tissue layers, not under the periosteum. The mastoid cortex appeared normal. The cellular tissue was softened and discolored; the antrum was full of pus and granulations.

The resulting wound after several weeks showed no tendency to heal; from the edges of the wound and antral cavity pale grayish granulations rapidly grew, which promptly re-formed on removal. Four weeks after opening the mastoid the patient was anesthetized and the wound curetted and the skin edges partly sutured. These sutures were removed at the end of the seventh day, when the wound again fell apart and the cavity was full of the same unhealthy granulations. These were removed and sent to the pathologist, who reported them to be syphilitic granulomata. Dr. Jonathan Wright stated in his report that "under the low power the

section has a patchy look; the round cells are crowded together in places, less thickly in others. There is very much cellular fragmentation, which is out of all proportion to the coagulation-necrosis, much more abundant than in tuberculosis. This is syphilis nine times out of ten." The patient was given intramuscular injections of mercury salic., gr. one-half once a week, with K. I. by mouth. Soon after two gummata appeared, one above, the other below the auricle, which promptly broke down and were opened. Otherwise the child has shown no specific symptoms and has gone on to uninterrupted recovery.

It has been impossible to find any syphilitic history in either parent or in the child's attendants. It has also been impossible to make satisfactory hearing tests to discover if the nerve was involved.

Discussion.—Dr. GRUENING said that it would be interesting to know just what syphilitic granuloma is and how the pathologist diagnosticates it.

Dr. COAKLEY said that one sees these syphilitic granulomata and frequently gets this report from tissue sent to the pathological department, and upon putting the patient upon antisymphilitic treatment the growths disappear. There were certainly pathological changes and appearances in which he did not feel that he personally knew enough to make such a diagnosis, and while a skilled pathologist might not always be willing to say that the granuloma was distinctly specific, there were certain characteristics which pointed very strongly to that conclusion.

REGULAR MEETING, DECEMBER 13, 1906, DR. EMIL GRUENING
IN THE CHAIR.

Report of a case of mastoiditis complicated with thrombosis of the cavernous, of the inferior petrosal, and of both lateral sinuses, leptomeningitis, etc. R. LEWIS, JR., M.D. (Published in full on pages 10-14, with autopsy report by G. S. DIXON, M.D.)

Discussion.—Dr. GRUENING said that, as he understood Dr. Lewis, the jugular was tied on the left side. He had reported some time since a case of double sinus thrombosis in which one jugular was tied, and the patient recovered. In

the present case he was inclined to think that the second jugular should not have been tied.

Dr. SPRAGUE inquired whether Dr. Dixon had found any unusual anatomical condition of the sinus on the left side. Usually the left lateral sinus does not go to the torcular, excepting through the straight sinus, which is smaller.

Dr. RICHARDS said that several years ago, at the Otological Section of the Academy, he presented a patient upon whom he had operated for sinus and jugular thrombosis, the thrombus having extended from the middle of the jugular in the neck to the torcular. As he did not during the operation feel justified in passing a curette into the torcular for fear of dislodging a portion of clot and starting emboli through the opposite side, he was preparing to explore the torcular and its confluent sinuses, when it occurred to him to block the jugular of the opposite side by firm pressure high up on the neck. This was done, with the result that the clot in the extreme torcular end of the sinus was expelled. He thought the procedure worthy of trial, and a means by which we might in certain instances avoid the ligation of the opposite jugular.

Dr. LEDERMAN said that some time ago he had read the report of a case in which both internal jugular veins were ligated, and the autopsy showed marked disturbance of the cerebral circulation.

Dr. GRUENING said that he could not recall that any case of double thrombosis had been reported in which double ligation had been resorted to. Since he had reported a case of double thrombosis with ligation on one side he had been looking out for cases of this kind.

Dr. DENCH said that he had seen a case of suspected thrombosis on both sides, and had shut off one vein and exposed the other. This was so big that he had hesitated to shut it off. He did not know of any case where both veins had been shut off simultaneously, though a number had occurred where one had been shut off, and then the other after an interval of a few days. He thought that shutting off both veins at the same time would have a dangerous effect on the circulation.

Dr. LEWIS, in reply, said that he had been able to pass directly and without any difficulty into the sinus on the

opposite (the right) side with the curette. This curettement was performed five days after the first operation and so, as in all likelihood the collateral circulation had been fairly established on the left side, the tying of the jugular on the right side would not have been such a serious matter as some of the gentlemen would have us believe. He certainly would attempt it in a similar case rather than be responsible for dislodging a portion of thrombus and allowing it to be carried down into the heart. He thought that Dr. Richards's point that pressure on the internal jugular vein and massage of the vein from below upwards was a good one and might be substituted in some cases, or at least attempted before proceeding to tie the vein.

Dr. DIXON said that he had noticed no abnormality in the sinus. Most of it, of course, was obliterated.

Report of four cases of mastoiditis in diabetic subjects, by J. D. RICHARDS, M.D. (published in full on pages 15-33 of this number).

Prognosis of operative procedures on the mastoid process in diabetic subjects, by E. L. MEIERHOF, M.D. (published in full on pages 34-43 of this number).

Discussion.—Dr. DENCH spoke of three cases of mastoiditis in diabetics, with two recoveries and one death. In the first case, there was a very high percentage of sugar and extensive mastoid involvement. Five days after the mastoid operation the patient developed erysipelas, and his temperature rose to 106°. He ultimately made a perfect recovery. The second case was that of a man who had been a diabetic for a number of years. Seven months before Dr. Dench saw him, he was operated upon for mastoiditis in a neighboring city. When he first came under Dr. Dench's observation, the external auditory canal was dry. There was a sinus behind the ear, from which there was a scanty purulent discharge. A probe introduced into this sinus encountered roughened bone. An examination of the urine showed about 3 per cent. of sugar. A very extensive operation was performed, the dura being exposed in the cerebellar and middle cranial fossæ. The patient did very well after the operation, and was sent back to his own physician, in a neighboring town. After his return home he developed erysipelas, and the percentage of sugar

in the urine increased very rapidly. The patient, however, made a perfect recovery. The third case was that of a woman, well advanced in life, who had suffered from diabetes for a number of years. Several years before the attack of mastoiditis, the patient had had an acute suppurative otitis upon the left side, which was relieved by free incision of the drum membrane. About two years after this attack, the patient again came under observation. At this time the urine was free from sugar, and the diacetic acid and acetone reactions were negative. She was then suffering from acute otitis media in both ears. Both drum membranes were incised, and the patient did well for a number of weeks, although there were some suspicious mastoid symptoms upon the right side, that is, upon the side which had previously been healthy. Quite suddenly there developed a swelling over the mastoid process, upon the left side. This swelling was tender upon palpation, and an examination of the canal showed a narrowing at the entrance of the meatus, while the canal at the fundus, close to the drum membrane, seemed to be fairly normal. Owing to the local tenderness, the post-aural swelling was deemed indicative of mastoiditis, and the mastoid operation was performed. At operation a perforation through the mastoid cortex was found, close to the root of the zygoma. The operation occupied but ten minutes. The patient rallied well after the operation, but died in diabetic coma three days after its appearance.

In view of the foregoing case, Dr. Dench said he did not regard the high percentage of sugar as having necessarily great significance, any more than its absence from the urine, in the case of a confirmed diabetic, warranted one in giving a favorable prognosis, as the result of any proposed operative procedure. And in the case just cited, although the patient had been a pronounced diabetic, all sugar had disappeared from the urine at the time of the operation, owing to proper diet and proper medication. In spite of this fact, however, the patient died shortly after the operation.

The speaker thought that the insidious manner in which mastoiditis developed in diabetics should be constantly borne in mind. There is very frequently extensive destruction of the bone, with very few general or local symptoms.

In regard to the advisability of making repeated incisions in the drum membrane, in these cases, in the hope of aborting the condition by drainage through the external auditory canal, the speaker was not in favor of this method of procedure. He noticed that Dr. Richards in his paper had incised the drum membrane three times in one case, and four times in another. On general principles, the speaker did not consider this good surgery. He believed that the operator should take his chances of opening the mastoid earlier in these cases, and thus secure perfect drainage, rather than to postpone operation until late, and then find extensive bony destruction. If the operation is performed rapidly, and especially if it is performed early, it seemed to the speaker that the prognosis was not very unfavorable, although, naturally, more unfavorable than in uncomplicated cases.

Dr. KOPETZKY reported a case of chronic otitis media with diabetes, a woman about forty-five years of age, who had two attacks of acute mastoiditis, superimposed upon the chronic suppuration. At the first attack the incision in the drum healed up but her diabetic condition became worse and finally the suppuration recurred. When first seen by Dr. Kopetzky the drum was not visible, suppuration was profuse, and a large polyp was evident in the ear. Examination of the discharge revealed streptococcus with mixed infection. At the time she presented herself for treatment she was suffering from the second acute exacerbation. Bearing in mind the high mortality of such cases, Dr. Kopetzky hesitated to operate, but under local anæsthesia he removed the polyp and curetted the tympanum. The patient no longer submitted to a restraining diet, and her diabetes grew worse, but the acute symptoms have subsided and she is comfortable now; the discharge has decreased very perceptibly. Here then is a case wherein the necessity for operation was avoided by local measures which were successful in spite of the general diabetic condition, and Dr. Kopetzky reported the case to show that these milder measures should be employed before resorting to the major operations on diabetics.

Dr. MCKERNON said that in looking over his case book previous to coming to the meeting he had noted twelve cases

of diabetic mastoids—eight in his own practice and four seen with colleagues, during a period of eleven years.

(1) Boy two and one-half years old, whose urine contained 1.5 per cent. of sugar at the time of operation. Duration of mastoid involvement 8 days. Operation, good recovery, but healing slow. Nearly the same amount of sugar in urine at the time patient was discharged.

(2) Man forty-four years of age, 1.88 per cent. of sugar in urine at time of operation; mastoid involvement three weeks. Operation, good recovery. Healing apparently as rapid as the average case. A little over three quarters of 1 per cent. of sugar in urine at time of discharge.

(3) Woman thirty-six years of age. .82 per cent. of sugar in urine at time of operation. Mastoid involvement two weeks. Operation; healing delayed. Trace of sugar in urine at time of discharge.

(4) Man fifty-six years of age. 1.66 per cent. of sugar in urine at time of operation. Mastoid involvement 10 days. Operation; good recovery; wound delayed but little in healing.

(5) Man fifty-eight years of age. 3.02 per cent. of sugar in urine at time of operation. Mastoid involvement for five weeks. Two attacks of coma prior to operation, one lasting six hours, the other all day—an interval of three days between attacks. Case profoundly septic. Operation on mastoid. Patient rallied slowly from operation, was conscious for three days. On the fourth day coma and death.

(6) Man seventy-five years of age. 2.6 per cent. of sugar in urine at time of operation. Mastoid involved for 12 days. Operation. Partial coma for six hours the day following the operation. After this patient made good recovery but healing was delayed.

(7) Woman thirty-eight years of age. 1.16 per cent. of sugar in urine at time of operation. Mastoid involvement one week. Operation; speedy recovery. Nearly 1 per cent. of sugar in urine at time of discharge.

(8) Woman fifty-two years of age. 4.66 per cent. of sugar in urine at time of operation. Mastoid involvement for five weeks. Patient markedly septic. Had had several attacks of partial coma prior to operation. Operation; coma on

sixth day, and death on eighth. Sugar rapidly increasing after operation.

(9) Man sixty-one years of age. .94 per cent. of sugar in urine at time of operation. Mastoid involved for seven weeks. Operation; good recovery; about the same amount of sugar in urine at time of discharge.

(10) Woman aged forty-four years. Urine contained 2.12 per cent. of sugar at time of operation. Mastoid involvement for three weeks. Operation. Coma on second day lasting between six and eight hours, after which patient made good recovery, although healing was delayed. The amount of sugar in urine steadily diminished after the sixth day, until at time of discharge there was not more than one half of 1 per cent.

(11) Man sixty years of age. 1.88 per cent. of sugar in urine at time of operation. Mastoid involved for two weeks. Operation; patient did well for four days. On fifth day coma, with death on sixth.

(12) Woman sixty years of age. Diabetic for years. Amount of sugar in urine at time of operation not known; had been between 2 per cent. and $3\frac{1}{2}$ per cent. Markedly septic with chills and fluctuations of temperature. Mastoid involved for from six to eight weeks. Operation. Marked improvement for three days. After this, intervals of coma each day, until death in complete coma on the eighth day.

Here were the histories of twelve cases, eight of whom recovered and four died. With such a showing as this Dr. McKernon did not think that such gloomy prognoses should be made. When such cases were seen in consultation, the patient or the family should be told just what condition exists and what are the chances, and let them decide the question of operation or not; but it seemed that when it came to the question of letting the patient go on and die of sepsis, we are justified in attempting to save the patient. In regard to the time element, he thought that this had much to do with the prognosis. In his cases chloroform anaesthesia was given in every instance.

The percentages of sugar in all these cases were taken from twenty-four hour specimens of urine.

Dr. MAYER said that he thought the specialist ought to

take a lesson from the general surgeon in operating upon the diabetic, and consider some of the things the latter is doing. A number of important operations had been performed upon the diabetic in a minute or a minute and a half—such as prostatectomy—under nitrous oxide gas. He merely mentioned this, in order to bring up the question of omitting chloroform anæsthesia and considering some other forms of anæsthesia in order that the patient may be operated, and operated quickly.

Dr. WHITING said that he had been particularly interested in the subject of the evening, for he had seen one of the cases referred to in the paper. Statistics on any subject when gathered from far and near are of course very fallible, but when one can give 10 or 12 cases from his own experience as Dr. McKernon had done, the deductions which he could make were very significant. One point in connection with sugar in the urine had not been mentioned. In dealing with the question of the percentage of sugar—unless perhaps one case which Dr. Meierhof had told of—the amount of the urine had not been accurately given in any of the cases referred to. Dr. Whiting believed that when a patient is seen with 7 per cent. of sugar in the urine and he recovers, it makes a vast difference whether he has 7 per cent. and is passing 40 ounces, or whether he has 7 per cent. and is passing 100 ounces.

He had just seen a patient with diabetes, otitis, and mastoiditis, who had acetone in the urine, diacetic acid, albumin, and casts, as well as the smell of acetone on the breath. There was no doubt about the mastoiditis, but he had advised against operation under the circumstances, unless it was done under local anæsthesia. It was very important to determine the actual amount of sugar as well as the percentage, as it makes a great difference whether a case of recovery is reported with 5 per cent. of sugar, without knowing the actual amount eliminated, or whether you report a recovery with $1\frac{1}{2}$ per cent. of sugar, stating that the amount passed was 150 ounces.

In his own experience he could refer to 11 cases, including the one seen to-day, upon which no operation has yet been done. Of the ten cases before that, the first eight had died. Several of these were seen a number of years ago, and in many

of them no note had been made of the percentage of sugar, acetone, or diacetic acid. Its presence had been noted in only the last three of the eight. Most of these patients had died in diabetic coma from 24 hours up to 5 or 6 days after operation. In the two remaining cases the percentage of sugar was 1.25 and 1.75 per cent. One of these was seen eight weeks ago and the other ten days ago. The one seen eight weeks ago has recovered and his wound has almost completely healed, and the other is living in a good condition, and has no temperature. The sugar in his urine had neither increased nor decreased without operation, still remaining at 1.25 per cent. In neither of these cases was any acetone or diacetic acid found. Dr. Whiting said that, in his experience, the presence of these two elements was associated with a fatal termination in every instance. In one of the cases which he had seen where acetone was present, the operator was not a man of very great experience and was somewhat embarrassed by what he had to do, and also by the fact that he was being urged to get through the operation as speedily as possible; and the operation was unduly prolonged, and the patient died. In the cases upon which he had operated in the last two months the bone portion of the operation was done in less than fifteen minutes, although both were cases of extensive epidural abscess. In one case chloroform was used throughout the anæsthesia, and the patient had made a good recovery; in the other case the anæsthesia was started with chloroform, but the house surgeon reported that he thought the man was dying as he could not feel the pulse, and it was suggested that he discontinue the chloroform and use ether. This was done, and the patient on the tenth day is now in good condition.

Dr. LEDERMAN spoke of one of the patients mentioned in Dr. Meierhof's paper. He had seen the case after the disease had existed about six weeks, and the local picture gave positive evidence of mastoid involvement—*i. e.*, tenderness over the antrum and tip, bulging of post-superior wall of auditory canal and membrana tympani, with constant discharge of pus, and headache over the left side. There was a temperature of 100–102° and the patient was very irritable. He had advised immediate operation, inasmuch as the existing conditions

were indicative, and the percentage of sugar had increased. At the operation the mastoid was found to be extremely diseased, the dura being exposed in the middle fossa. No time was lost in getting the patient off the operating table. Three sutures were introduced in the skin wound. Chloroform anæsthesia was employed. The case progressed nicely for five days, but died in coma on the sixth day. The skin wound had healed and granulations had started to appear in the bone cavity, which had a healthy appearance, showing that there existed considerable resistance in the tissues. Had the operation been performed earlier in the disease, the patient would have better withstood the shock. The percentage of sugar had increased during the course of the ear trouble, and acetone also appeared. No sloughing of the tissues was noticed at the dressing on the fifth day.

Dr. EAGLETON said that his personal experience in the mastoid operation on diabetic patients had been confined to one case, although he knew of two others in the practice of colleagues, both of whom died in coma shortly after the operation. His own patient was seventy-six years of age, and at the time of the operation, the urine contained but little sugar, although his physician stated it had been present off and on for some time. The patient did well but no granulations developed. Seven weeks after the operation the wound, although clean and free from pus, contained no granulations, having the appearance of having been made but a few days prior. During the seventh week, the patient suddenly developed gangrene of the big toe, and died in coma three days later. We have heard this evening of a number of cases containing a large percentage of sugar recovering, and others with a low percentage of sugar dying. Would it not therefore seem reasonable that the percentage of sugar has very little to do with the question? There are a few points, however, to which attention has not been called this evening, which may be of some service to us in making a prognosis in operating on these patients.

First.—We know that diabetes in very young people has a very unfavorable prognosis; nearly all such cases die in diabetic coma. The use of an anæsthetic in such young diabetics must be attended with greater risk than later in life. It would

seem that the ether acting as a toxine with the degeneration in the cells of the liver, which as is now known it always produces, adds the last straw to the already toxic condition from the diabetes, and so precipitates the coma. Both of the cases of death in diabetic coma following mastoid operation that I know of in the practice of colleagues occurred in very young people.

Second.—We know that arterial sclerosis is a frequent complication of diabetes. Its presence not only delays the healing of the wound, but makes general sepsis much more probable.

Third.—A certain proportion of all patients suffering from diabetes has loss of the patellar reflex, the so-called diabetic tabes, showing a degeneration of the ganglionic cells of the cord similar to those found in pernicious anæmia. All these patients so affected stand operation very poorly. Both of Dr. Richards's cases exhibited to-night have no signs of arterial sclerosis that I could discover, and the patellar reflex is very prompt.

Dr. GRUENING said that in his experience at Mt. Sinai Hospital the patients are generally brought into the hospital in the last stage of the disease. All of these cases of mastoid complicated with diabetes had perforation at the apex; they were cases of the so-called Bezold's mastoid. In his private practice he had lost several cases and had been able to save several. One of these was in a gentleman of sixty-eight with a double mastoiditis. The operation was performed in two stages, first on one side, and then a few days later on the other. The patient recovered. Where the perforation is at the apex and the soft parts are infiltrated and necrotic the disease generally terminates fatally.

Dr. RICHARDS, in closing the discussion of his paper, said that Dr. Dench had called attention to the fact that repeated paracentesis had been done on two of the cases reported. He would like to state that these repeated incisions of the drum were made before the cases came under his observation. He agreed with Dr. Dench that to make repeated incisions of the drum in the presence of sagging postero-superior canal wall and mastoid tenderness is not good surgery.

Dr. Whiting in his remarks had stated that in neither of

the papers read had there been any reference to the total quantity of urine passed in twenty-four hours. In two of the cases he had reported which recovered, he had distinctly stated that one patient was passing three quarts of urine in twenty-four hours, that the urine showed 3 per cent. sugar, and that neither diacetic acid nor acetone was present; that the second case which recovered was passing five quarts of urine in twenty-four hours, specific gravity 1.030, that there was 10 per cent. sugar, and that both diacetic acid and acetone were present.

He had been struck by Dr. McKernon's report of his cases. The Doctor had mentioned the presence and the percentage of sugar in these cases but had made no mention as to whether or not the patients had the general symptoms of diabetes present. The mere presence of sugar in the urine is certainly no indication that the patient is a diabetic. If the presence of sugar in the urine is taken as the basis of the diagnosis we are apt to err.

When on the House Staff of the New York Eye and Ear Infirmary he had been struck by the fact that after the visiting days, when the patients had grapes and fruit brought them by friends, it was common to find sugar in the urine in a comparatively large percentage of the hospital cases.

Dr. MEIERHOF, in closing the discussion on his paper, said that Dr. Whiting was correct in regard to the importance of estimating the amount of sugar as well as the percentage. He had not dwelt upon this point as he had not wished to lay too much stress upon clinical phenomena, but his reports of some of the cases were based upon a twenty-four-hour collection of the urine. A patient may pass a small amount of urine highly concentrated, where a high percentage is indicated; and on the other hand he may pass a large amount with a low percentage, so that the daily excretion of sugar should be ascertained. Clinically we ought to consider diabetes in three classes: one where the symptoms are not severe, and the patients do not lose much weight, but have a chronic condition of diabetes; in another class the disturbance is severe, but these respond to diet and treatment; the third class are the bad cases which do not respond to any treatment

but go on from bad to worse. In this third class of cases a mastoiditis would be a serious matter.

Dr. Gruening's comparison between his hospital and his private cases bears out the assertion that early operation is of the greatest importance. Dr. Meierhof said that he was not alone in making this statement, as all the German operators especially are in favor of operating early and not waiting until the symptoms become severe.

REGULAR MEETING, JANUARY 10, 1907. DR. WENDELL C.
PHILLIPS, CHAIRMAN.

Papers

The present status of the question as to progressive spongification of the labyrinthine capsule. By NORVAL H. PIERCE, M.D., of Chicago. (Published in full on pages 44-61 of this number.)

Dr. DENCH said that he had greatly enjoyed the masterly way in which the subject had been presented by the writer of the paper. The subject is one which is attracting more and more attention in the otological world. The chief difficulty is in making a correct diagnosis, but he sometimes wondered when he was quite sure that he had reached a correct diagnosis whether or not he had done a good thing for the patient. The condition is so absolutely hopeless, and the mental attitude of persons afflicted with progressive hardness of hearing is so hopeless, that it was questionable whether it was wise to tell them the whole truth. It is better if we can hold out even a little hope to them, and we should always remember that even the best and most careful sometimes make a wrong diagnosis. He had seen a number of cases where he had given a hopeless prognosis, but had continued treatment at the patients' urgent request, and found that he had been wrong, although he had based his conclusion upon the "triad." While in a good many cases one can make the correct diagnosis, it is well not to be too positive. When we come to analyze the evidences referred to by Dr. Pierce—the elevation of the lower tone limit, the increase in bone-conduction, the preservation of the upper tone limit—we must remember that these three reactions are found in middle-ear conditions pure and simple, and many cases of localized

congestion about the oval window will give exactly these reactions, and will have pronounced deafness—all of which will disappear under a little local treatment. We can only be sure of a diagnosis after prolonged observation and careful differentiation. It is not absolutely essential to know whether there is a spongification or inflammation of the labyrinthine capsule in order to make a prognosis. In many of these cases where the disease affects the inner surface of the stapes and invades the lower turn of the cochlea there is interference with the upper tone limit. When Dr. Pierce says that the upper tone limit may not be lower than 4 of the Galton whistle and still be normal, that was not in accord with his own observation of the normal upper-tone limit. In most ears he had found the normal upper limit to be 1 to $1\frac{1}{2}$. Anything lower than 2 is decidedly pathological. When he finds 2, $2\frac{1}{2}$, 3, 4, he always concludes that there is some lesion of the labyrinth.

As to treatment, when a spongification exists, nothing can be accomplished by local treatment excepting during an acute catarrhal inflammation of the upper air tract. The patients should be kept in good condition so that they will have as few acute attacks as possible, and when these do occur they should be relieved promptly, which will help the patient, but for the relief of the bone lesion nothing can be done, though perhaps if the stapes were removed early there might be a chance of improving or limiting the disease in cases where the disease began in the region of the stapes, and he would be tempted to try it. In a certain proportion of cases pilocarpin is very helpful. One patient who has been suffering from this condition for nearly three years took pilocarpin for a year and a half before receiving any special benefit, but in the last five or six months he has improved very decidedly.

Dr. BRYANT said that the difficulties of diagnosis had been emphasized. His opinion was that, except in very typical cases, the diagnosis was always in doubt. When there was a clear picture of a normal middle ear and tube, as described by Dr. Pierce, with a diminution of air-conduction in proportion to the bone-conduction, the diagnosis was positive, but not otherwise. As to the treatment of such cases, general hygiene is the chief factor. Most of the patients are women,

and the commencement of the trouble has generally been attributed to some nervous strain, general disease, or disturbance in sexual function. Many of them date from the first menstruation or pregnancy. In the cases that had come under his observation, the improvement of the general hygiene, menstrual disturbances, and especially relief of nervous strain had given the best results.

Dr. HASKIN said that he had understood Dr. Pierce to say that the prognosis was not always unfavorable, and that many of these cases had been known to stop suddenly and without bad result to the patient. Many of them go on to a certain point and then remain stationary indefinitely. It was of the greatest importance to make a complete and careful diagnosis, in order to reassure the patients and give them all the help possible, or at least keep them in a happier and more hopeful frame of mind.

Dr. DUEL said that in a large majority of cases a fairly positive diagnosis could be made, but in others it was practically impossible. He agreed with Dr. Pierce that when a positive diagnosis of otosclerosis was established, the patient should be told the futility of all local treatment, but should be given general directions and kept under observation. He thought that Dr. Dench had been mistaken in thinking Dr. Pierce had said that 4.0 was the normal upper-tone limit of Edelmann's whistle. This was not the impression that he had received from the paper. He had found, as had Dr. Dench, that the usual limit was from 1.0 to 1.5 with the Edelmann whistle. If both ears gave the upper tone limit from 0.8 to 1.5 he put that as the normal upper-tone limit for the patient, but if there was a difference he considered it as a defect on the one side. A point which had always interested him was that in a certain number of cases in which there was a very evident absolute increase of bone-conduction, not only was there a distinct raising of the lower tone limit, but also a distinct lowering of the upper tone limit—in some cases up to 10.0 Galton. He had come to think that in these cases the distinct lowering of the upper tone and raising of the lower tone was due to a fixation of the stapes. He had not seen this point mentioned, but it seemed to him that there was no other way to account for the fact.

Dr. PHILLIPS said that the diagnosis of non-purulent ear diseases was always important, and even when no marked improvement in hearing or even relief from tinnitus could be effected, it was far better for a reputable otologist to have the watchcare of the patient than to have him consult quacks, and to this he will usually consent if a plain statement of facts is given, with an explanation of the importance of careful hygiene and attention to general health. He told of a patient now under his care who had been the rounds of many doctors. Her chief symptom was tinnitus, and when after a careful test of various remedies and treatments no improvement was noted, the condition was explained to her and she was told that so long as her hearing was not diminishing it was much better for her to endure the tinnitus and make no further efforts after treatment. She now reports once a month and is carefully tested, and her general physical condition looked after. The tinnitus remains about the same, the functional tests are the same, and the disease is *in statu quo*, so far as symptoms are concerned. Mechanical forms of treatment are generally harmful, and aural massage, the use of the Siegel otoscope, catheterization, etc., are all harmful and usually increase the symptoms of the disease.

In closing the discussion, Dr. PIERCE said that Dr. Haskin had replied to Dr. Dench's remarks in regard to the progressiveness of this disease. It is not by any means a progressive deafness in all cases; it may come to an end at any time, or the changes in audition may not be apparent for ten, fifteen, or even twenty years; it is rapidly progressive in only a very few cases. This phase of the question was considered in the paper.

The triad—increase of osseous conduction for low sounds, the elevation of the low tones, the negative Rinne—may all be found in cases of catarrhal deafness. It is only when we find the absence of catarrhal symptoms—so-called—in the tube, and when we find a patulous and a dry tube, when we find an entirely normal membrane, and Bezold's triad, that we are inevitably right in making a diagnosis of spongification of the capsule with the fixation of the stapes. Bezold's triad may be present in any condition of suppurative inflammation, where the ossicles, with the exception of the stapes,

are absent. If the stapes is ankylosed there will be an elevation of the low tone, and a long osseous conduction of the low tone, and a negative Rinne, but the question of diagnosis as to the cause of stapes ankylosis does not come in question in these cases. We may have the same symptoms in temporary stapes ankylosis of young children, for instance, where there is complete occlusion of the Eustachian tube and the air of the tympanic cavity has been absorbed, and the pressure in the external ear is so great as to force the stapes in the fenestra ovalis; but the question of spongification of the capsule does not come into consideration at all.

There are cases of combined inflammatory conditions of the middle ear and stapes ankylosis which are difficult to diagnose, and these must be observed for some time before we can make a proper diagnosis. There are cases of nerve deafness and stapes ankylosis which are difficult to differentiate—they may require one, two, three visits, but he had endeavored to mark out the way in which a differential diagnosis can be reached.

Regarding the upper tone limit, Dr. Dench had misunderstood him and Dr. Duel was right. He had not said that 4 was the normal tone limit in Bezold-Edelmann whistle, but that anything below this should arouse suspicion at once of nerve involvement, and it is in these cases of spongification where there is a diminished upper-tone limit up to 4 or islands of defect below this in Edelmann's whistle that we have the worst prognosis. Another practical fact is that when there are a diminished upper-tone limit and the characteristic "peach-blow" color of the membrane, the case has a most serious prognosis. Fixation of the stapes itself does not necessarily occasion this reduction of the upper tone limit. It is the process which is going on in the labyrinthine capsule which causes these islands of defection and decrease in the upper tone limit, and it is one of the points which Bezold affirms as additional evidence of Helmholtz's theory of the resonator function of these little crypts between each lamella spiralis. The resonator function of the cochlea is reduced or destroyed by the spongification of a normally hard labyrinthine capsule.

REGULAR MEETING, FEBRUARY 8, 1907, DR. WENDELL C.
PHILLIPS IN THE CHAIR.

Case of advanced granular nephritis, with symptoms simulating those of brain tumor. Reported by Dr. BOND STOW.

Dr. BOND STOW said that he had not come to the meeting with any idea whatsoever of reporting this case, but had been speaking of it to the Chairman (just before the meeting was called to order) who had asked him to present it to the Section as being especially pertinent to the subject of the evening.

On Saturday last he had had the privilege of performing an autopsy in a case which he had seen twice before death, and where he had made a very careful analysis of the symptoms and ventured the diagnosis of brain tumor, probably located in the cerebellum. This diagnosis was based on the symptoms that for several weeks the patient had suffered from: persistent vomiting, cerebellar ataxia, decided vertigo, interference with respiration, irregular and rapid pulse, some defect in hearing in that he could not accurately distinguish a watch ticking at a distance of $1\frac{1}{2}$ to 2 feet. The last time the patient was examined, the mentality was low, and he spoke with great difficulty; he could understand what was said to him only after considerable thinking, and then replied slowly and hesitatingly. There was also difficulty in swallowing, in that on taking a swallow of water he would hold it in his mouth for sometime before swallowing it, refusing to do so for fear of choking, and at times there was more or less of choking when swallowing. There was no edema anywhere throughout the body, the skin being dry and normal in every respect, and there was nothing in the color of the skin that would lead one to suspect kidney trouble. The first consideration in establishing any diagnosis of occult nature is the condition of the urine, and one should never venture upon a diagnosis without information in this respect. In this instance the interne assured him that there was no albumin, no sugar, the quantity was about normal, a normal amount of urea, and the specific gravity 1.025. With such findings, and the total absence of any cachexia or appearance peculiar to kidney conditions, he excluded the

kidney affection and devoted himself to the cerebral symptoms. The ophthalmologist reported choked disk in both eyes, and his own ophthalmoscopic examination showed that the vessels of the eye were decidedly engorged. With these conditions he could make no other diagnosis than that of intracranial pressure, probably due to a tumor in the cerebellum. One other symptom was that the patient insisted upon lying on the right side.

Naturally he was very much interested in the case, and when the report came to him on Saturday evening, with permission for an autopsy, he went at once and performed the same within six hours after death. To his surprise, there was no tumor whatever to be found in the brain; nothing but a hypostatic congestion œdema, and intracranial pressure due to an increase of fluid in the lateral and third ventricles. There was marked hypertrophy of the left ventricle of the heart. There were no valvular lesions. The kidneys had undergone extensive granular changes and were highly sclerotic. It was difficult to conceive of any one living so long with kidneys in such a condition. Dr. Stow thought his diagnosis had failed because of the urine analysis report, and that if a more careful analysis had been made albumin would have been found as well as casts, and with the other indications a correct diagnosis would have been established, showing that uræmia was present. He spoke of this case with honesty and frankness, and though he had been mistaken in his diagnosis he felt that under the circumstances the conclusion he had reached was justifiable, for being guaranteed that the urine was normal there was nothing in the appearance of the man to indicate disease of the kidneys. He spoke of this case in order to particularly impress upon the profession present the strenuous need of knowing *for yourself* in every case of importance the exact condition of the urine. Internes in our hospitals to whom the work of urine-analysis is relegated often grow hasty and careless in this work and frequently totally fail to grasp its vital importance as the corner-stone in any well-laid diagnosis.

Dr. PHILLIPS said that this was certainly a most interesting and instructive case and should appeal with force to all who are interested in the question of cerebral complications

in connection with otitis media. Within the past month he himself had had two experiences which might serve to emphasize Dr. Stow's remarks in connection with this case. In one instance the patient had an extreme vertigo with a chronic discharge from the ear, and all the symptoms of an acute mastoiditis, and other symptoms pointing to the presence of a cerebellar abscess. He decided to operate, but before doing so a urinary analysis was made, with negative results. A radical operation was performed, occupying about one and three-quarter hours, as there seemed to be no need for haste. This was on a Sunday. The following day a more complete test was made of the urine, and the report was that it showed 11 per cent. of sugar—the highest percentage he had ever seen in any case upon which he had operated, and yet the patient went successfully through the operation, and upon being put upon a diabetic diet the symptoms all subsided and she eventually recovered. This is simply another instance to show the importance of a careful examination of the urine. In another case the patient had a purulent discharge from the ear, lasting for a week or ten days. This happened over a year ago. In three months he had vertigo, which gradually increased until it became very extreme. There was a loss of bone and aërial conduction in the ear that had been discharging, and with all these symptoms there was a partial paralysis, especially of the muscles over the trigeminus. His vertigo was so severe that at times he was unable to perform his ordinary farm work. There was severe pain about the angle of the eye on the affected side, radiating into the ear and into the left side of the head. There was a marked papillitis, with some hemorrhage, and some engorgement of the vessels, more marked in the left eye than in the right. With all these symptoms there was no involvement of the kidneys so far as could be determined. Dr. Richards had also seen the case, and agreed with Dr. Phillips that there is probably present some form of cerebellar tumor. There is no history of syphilis, either hereditary or acquired, and the symptoms point to a cerebellar tumor rather than to a cerebellar abscess, as there is no indication whatever of any absorption or infection. If any indication of kidney lesion could be found, he would be inclined to consider the symptoms

due to that cause. The patient has been put upon large doses of iodide of potash for a few days, and the symptoms have improved somewhat, though the amelioration is not marked. Such cases are of great interest to the otologist, for there is much yet to be learned in regard to the intracranial complications of middle-ear diseases.

Our present faulty methods of brain localization in lesions complicating aural diseases. By S. MACCUEN SMITH, M.D., Philadelphia. (Published in full on pp. 62-78 of this issue.)

Discussion.

Dr. SACHS said that he was not a little comforted in knowing that, after all, our methods of localizing brain lesions are not particularly faulty. So far as he could infer from Dr. Smith's able paper the otologists and neurologists do not encounter greater difficulty in localizing these lesions than do medical men generally in almost any attempt to diagnose mysterious and deep-seated diseases. That we do not always succeed is natural. All we can do is to be guided by such data as have been established by experimentation and the study of cases at the bedside, and if we succeed in the vast majority of cases we must be satisfied. If in say 10 per cent. of the cases we err, we simply acknowledge that we are human. He could not feel that diagnostic methods as they have been taught and adopted are faulty, though they may not be perfect. The questions that the otologist encounters are relatively easy. The matter of diagnosing a cerebral or a cerebellar abscess when there is a preceding history of ear disease is not so difficult; but in the absence of traumatism or previous ear disease, or other distinct etiological factor it is sometimes very difficult indeed. In abscess, of course, the general train of symptoms is always present: vertigo, headache, stupor, coma, change in the pulse rate, the occasional presence of optic neuritis—although that is sometimes misleading. In reference to the diagnosis of such abscesses as are met with in connection with otitic diseases, there is one symptom so often present that he was astonished it was not cited as almost positive proof of cerebellar involvement. This is a very slight weakness of the rectus externus, which of course is due to involvement of the abducens, which is

almost invariably compressed. This gives rise to what appears to be nystagmus, due to greater pull of the inner muscles. He had not seen a case in which cerebellar lesion of any sort was present, in which there was not at least a slight weakness of the rectus externus; and if this symptom is present with a diminution of the reflexes—of the knee jerks in particular—and the cerebellar ataxia, where the patient even in bed may be so dizzy that he cannot turn his head without unpleasant symptoms that point to the cerebellum, there is very little doubt as to the location of the lesion.

With reference to other abscesses, there is a symptom in connection with temporo-sphenoidal abscesses, especially if the disease is on the left side, which is not looked for so carefully as it should be. With this in view, he had gone over the reports of temporo-sphenoidal abscesses, particularly those made by otologists and neurologists, and it is a fact that sensory aphasia, particularly word-deafness, is not recorded so frequently as it must have been present. This is not a symptom that obtrudes itself—it has to be looked for. The patients appear to speak normally and have, as a rule, motor speech intact. They can express themselves clearly, and unless you interrogate them and put questions as to whether they understand particulars you will fail to elicit a partial sensory aphasia which is one of the most important symptoms. Dr. Sachs claimed that there could be no temporo-sphenoidal abscess of any extent in the left half of the brain without this symptom, and yet the number of cases in which it is reported are very few. Some time since he had reported a case where the woman gave a history similar to the one reported by Dr. Smith this evening. She had a chronic discharge of the ear for years, which then ceased, and was well until twenty-four hours before he saw her. She was then in a stuporous condition and was supposed to be developing meningitis. She had no rise of temperature, and though slightly stuporous could get out of bed, and when interrogated appeared to be silly and more stuporous than her general condition warranted. She could walk around and acted rationally, but would give silly and irrelevant answers. On closer questioning it was found that she had a distinct sensory aphasia, and no other localizing symptoms. If that had been

reported as simply a case with general cerebral symptoms and a little stupor, the sensory aphasia would have been overlooked; but as this was suspected the woman was asked to write, and it was found that she had lost the knowledge and power to write, and the conclusion was reached that there were not only a sensory aphasia and a temporo-sphenoidal abscess, but that the abscess was deep and interfered with fibres that come down from the vicinity of the motor area on the same side of the brain. When the brain was exposed the surface was entirely normal, and the surgeon hesitated to go in, but upon being urged he went in an inch and a half or more and evacuated a large abscess. The woman recovered in two weeks, and has been well ever since. In this instance, unless the sensory aphasia had been especially looked for it would have entirely escaped notice, and Dr. Sachs said that he regarded this as by all odds the most valuable symptom of this condition.

There should therefore be no difficulty in localizing a temporo-sphenoidal or cerebellar abscess, or in differentiating between the two, though we may occasionally go wrong. He then cited a case occurring a short time ago in which he could not determine at first whether the patient was suffering from nephritis or from an intracranial neoplasm. The diagnosis could not be made until secondary deposits appeared on the skin, and then it was evident that there was a neoplasm. The patient finally died from general carcinomatosis. All we can do in such cases is to use the knowledge we have and make the best of it.

Dr. SACHS said that he was much more troubled about the proper treatment of a brain abscess than about its localization. He could not understand why when a temporo-sphenoidal abscess was suspected the surgeon should not go in over the mastoid region and lay open a large area of the temporo-sphenoidal region, and then make either several punctures or a clean-cut incision through a good part of the temporal lobe, which would heal readily, and if an abscess were found it could be cleaned out and drained properly. The question of success lies in the proper surgical drainage of the abscess. In temporo-sphenoidal abscesses the question of drainage is much easier than in parietal abscesses, which are, of course,

less frequently encountered. The parietal abscess cannot be drained easily without danger to important tissues. The question that the otologist should especially consider is the after-treatment, the proper principle of drainage. In temporo-sphenoidal abscesses the incision should be made after a thorough exposure of the temporo-sphenoidal lobe, keeping somewhat away from the site of infection. So far as we know, the area for the auditory centre is on the border of the first convolution. Go up as high as possible and make an incision there, keeping away from the site of infection. There is no reason why the surgeon should not be bold in this matter. A simple incision if done with proper precautions does no harm. Much more harm is done by operating in the dark and encouraging infection in that way. A clean-cut incision through a large part of the temporo-sphenoidal lobe will do no harm, but it is for the surgeon to decide whether he shall make one or more incisions. The question is whether it is best to drain through a sinus which already exists, rather than to expose an entirely new surface of the brain. Personally he preferred the latter method, though he was open to conviction. He would like to have Dr. Smith's opinion on this point, for it is one of great importance and concerning which there is great diversity of opinion.

Dr. PHILLIPS asked Dr. Sachs to explain how he would bring out the symptoms of sensory aphasia—what variety of questioning he would employ.

Dr. SACHS replied that before answering this he would like to say one word more in regard to the question of drainage. During the past ten years he had had opportunities of seeing many otologists operate, and as the result of his observation and experience, if there was any one method which he considered very very bad it was that of draining through the attic, or utilizing in any way the old source of infection. Much better results are obtained by disregarding the ear altogether—of course performing the necessary internal manipulation, but considering the brain and brain operation as a thing entirely apart. In the case of the patient to which he had referred, he had insisted upon this point, and the surgeon was very willing to attempt it; and the result was very brilliant, for the woman recovered in two weeks, which was

a remarkable result for an abscess of that size—it evacuated half an ounce of pus or more. He was convinced that the good result was largely due to the fact that the brain abscess was treated independently of its otitic origin, and he decidedly favored this method of operating, so far as he was entitled to make any suggestion.

The question of examining for sensory aphasia was very simple. It depends simply upon observing whether a person understands speech. This can be determined by asking the patient to do certain things and noting whether they are done, being careful not to use gestures,—not use the hands or eyes to suggest the action, but simply speak. Ask the patient to do a certain thing which he is not accustomed to doing. For instance, to touch the right ear with the left hand, or show the teeth, or close the eyes, or go around the room and touch the window-sill—anything which he is not accustomed to doing, and observe if he understands what is said. Patients often have absolutely normal speech, and do not themselves realize that there is any defect. Of course you can soon discover what the defect is and how great it is.

Dr. ARWOOD said that he had greatly enjoyed Dr. Smith's able and interesting paper, and he agreed with Dr. Sachs that the localization of brain lesions had become much simplified owing to the advance that has been made in the knowledge of brain functions, and of the cortical and sub-cortical regions. He had nothing to add to what had been said, but merely wished to call attention to the fact that it has recently been found that the X-ray is of considerable value in localizing abscesses as well as hemorrhages and growths in these regions.

Dr. BOND STOW said that he did not understand how and wherein the X-ray would reveal an abscess. He could understand how it might be useful in case of a tumor, but not in that of an abscess, which would simulate more or less the same substance or density as the brain itself.

Dr. ARWOOD replied that he had no personal experience with the X-ray in the diagnosis of brain abscess, but that Phaler states that such use is practical in the early stage, at which time its use should be especially desirable.

Dr. KENEFICK said that he felt very grateful to Dr. Smith for his valuable paper, and had no criticism to pass upon it,

but he took issue with Dr. Sachs's advice in regard to opening a temporo-sphenoidal abscess by a high incision. During the past ten years at the New York Eye and Ear Infirmary he had seen no temporo-sphenoidal abscess opened in any other way than by the removal of the squama through the usual incision. In the great majority of cases the abscess cavity lies in very close proximity to the carious bone through which the process has penetrated, and it would seem that the most logical place to open it would be as low down as possible, and not high up as Dr. Sachs advises. He felt that most otologists would agree with him that the place to open a temporo-sphenoidal abscess is as near as possible to the place of entrance and, of course, through the squama. Such a case as that reported by Dr. Smith was very unusual.

Dr. MYLES expressed his high appreciation of Dr. Smith's paper, and said that he felt the Section was also indebted to Dr. Sachs. He had long felt that we needed more light upon this subject. Ten or twelve years ago he had reported a case of temporo-sphenoidal abscess in a child which was published in the *Annual Transactions* of the American Otolological Society. The abscess was a very extensive one—an inch or more in diameter, and communicated with the roof of the attic, its lower border evidently resting upon it. When the bone was broken through, the pus gushed out and continued to discharge for some time. The child recovered, but showed some mental hebetude for a year. He thought that the recovery was due to the fact that he had not disturbed the phagocytic walls. Dr. Macewen speaks of the creating a new source of infection by disturbing this wall. Instruction concerning definite localization of the abscess, and definite procedure in regard to drainage, is received with keen desire for more.

Dr. H. KNAPP thought that the most rational way to detect an abscess in the process of the disease is to follow the abscess in its origin and growth. It is very seldom that an uncomplicated otitis produces an abscess. We know by clinical experience that three-fourths of the abscesses occur in the temporal lobe; furthermore, we know that the caries in the tympano-mastoid cavities breaks through the bony roof of the tympanum and the roof of the mastoid antrum. The pus extends to the neighboring layers and also through the roof

of the antrum. From either of these passages an abscess may develop, and clinical experience has taught us that the abscess is almost always in close proximity to the perforation. As there is no geometrical relation, we have to follow the passages of the suppuration through the tegmen tympani and the tegmen antri. We know also that the distance from the cranial surfaces of these roofs is only 3-5mm and mostly we can penetrate along through these fistulæ into the abscess. Following the process of the destruction, we are sure of the location, and can enter the pus cavity. This is certainly the best way to discover the collection of pus, and it appears natural to enlarge the fistulæ and let the pus escape through them. The treatment should follow the same lines. No more direct drainage can be imagined. This seems all right; the patient feels relieved at once, and for a few days improves in every way, but soon begins to show another picture and grave intracranial symptoms appear, followed by death. What is the cause, as everything seemed to have been going so well? Clinical experience again comes in with her stubborn judgment. The opening has been insufficient. Other parts of the brain have been invaded, and the patient dies of purulent inflammation. The rational method has had some success on its side, but it has abutted upon the well-known experience. The worst fault in opening a brain abscess is an insufficient opening. Bergmann, Professor of Surgery in the Berlin University, who has written an excellent treatise on brain surgery, follows the method we have found so rational, and goes just so far as we do in finding the abscess; but then he removes the skull above the ear and goes boldly through the squama, and the bottom of the middle cranial fossa, and maintains a sufficient aperture to observe the disease until the pus and fever have disappeared.

Dr. OPPENHEIMER said that a rather unique case had recently come under his observation which illustrated the difficulty of making a diagnosis of temporo-sphenoidal abscess, and a point which proved to be of great value in aiding in establishing the diagnosis was the alteration in the pulse rate. A little girl of five had an acute double otitis which required a double mastoid operation, involving exposure of the dura over the region of the attic. The child made a prompt

recovery, but four months afterward developed some intestinal symptoms for which she was treated. Following the intestinal attacks, the general condition of the child remained poor. There was no pronounced condition, but she complained constantly of being tired. This state of affairs lasted for four months, making in all eight months after the period of operation. The blood examination showed a slight degree of anæmia, the temperature was about 100° F., never quite reaching normal. Optic examination proved negative, and there was no evidence of splenic enlargement. The blood examination showed no malarial infection. The child complained occasionally of headaches. Dr. Manges and Dr. Cohn, however, discovered certain alterations in the pulse rate. The pulse, which had been at 90, would drop suddenly to 60 and even to 55. This condition lasted for several weeks, and Dr. Oppenheimer was then asked to examine the child again. He found nothing to lead him to suspect intracranial lesion, but Dr. Manges felt that there were some indications of intracranial pressure and it was decided to open the mastoid and again expose the dura. The original exposure of the dura had been rather large and it was found to have prolapsed into the cavity which had been the mastoid antrum. Incision was made an inch above the auditory canal into the dura, which seemed to be normal, and this was followed by a gush of pus—about an ounce and a half being evacuated. The encephaloscope was introduced and the marginal portions of the cavity were inspected, and revealed what seemed to be a distinct limiting membrane. At the time of the first dressing a gush of rather serous fluid took place in this cavity, which was probably due to a little over-manipulation, and it was realized that a connection had been established between the ventricles. The patient developed a meningitis and died. Dr. Oppenheimer said that he had related the history of this case simply to show the value of the pulse rate as being suspicious of intracranial pressure and aiding in this case in the diagnosis of brain abscess.

Dr. MACCUEEN SMITH, in closing the discussion, said that his chief object in presenting a paper on this subject was the hope of eliciting a discussion, and he had been much interested in what had been said this evening, especially in the points that Dr. Sachs had made in regard to the paralysis

of the rectus externus and the sensory aphasia, as indicating abscesses of the temporo-sphenoidal or cerebellar regions. At the same time, and notwithstanding the experiments which have enabled us to so often localize these abscesses accurately, there remain many cases which we are absolutely unable to localize. He had probably seen more of these failures than many of his New York friends, and now recalled one notable case.

The wife of a colleague from a southern State was brought to Jefferson Medical College Hospital for consultation, and was examined by some of the leading authorities, both medical and surgical, of Philadelphia. The case was studied for one or two weeks, and subsequently two operations were performed, but the abscess was not found, and she was finally taken home no better than when she arrived. A little later she died, and a post-mortem examination revealed an abscess in a part of the brain which had not been suspected, on account of the entire absence of localizing symptoms.

In regard to the point of opening, Dr. MacCuen Smith could not but feel that if an opening in the roof or antrum were found during the operation, it was good surgical procedure to favor drainage through the opening which already exists. He had seen some cases which were drained by enlarging the carious opening through the tympanic roof, with but one death in probably eight cases. He agreed with Dr. Sachs in regard to the importance of free incision and proper after-treatment. One is not so apt to have, or to induce, septic foci by incision as by puncture. For exploratory purposes, Dr. MacCuen Smith uses Dr. Chevalier Jackson's forceps, which does less damage to the brain than a probe. This is an excellent little instrument for locating pus, but you must make a free incision if you wish to secure good results. In a joint case which he had recently attended with a general surgeon, there was an opening through the roof and also one through the cortex above the ear. This case has been very ill, but is now rapidly recovering.

He also called special attention to the satellite abscesses. He had seen cases where there were secondary abscesses arising from the parent pus formation, and he believed that where death occurred it was chiefly due to the infection made general by these satellite abscess formations.

REPORT ON THE PROGRESS IN OTOTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1905.

BY PROF. ARTHUR HARTMANN, BERLIN.

Translated by Dr. ARNOLD KNAPP.

NERVOUS APPARATUS—(Concluded).

341. WANNER. A case of bilateral deafness for speech after injury to the skull. *Monatsschr. für Unfallheilkunde und Invalidenwesen*, No. 9, 1905.

342. GRAY. The pathological condition found in a subject who had suffered from deafness during life. *Lancet*, August, 19 1905.

343. MCBRIDE. A case of sudden and simultaneous onset of cephalic bruit and deafness. *Trans. Otological Society*, United Kingdom, 1905.

344. HORSLEY and RUSSELL. Vertigo, its pathology and treatment. *Trans. Otological Society*, United Kingdom, 1905.

345. LAKE. Case of removal of part of the cochlea, external wall of vestibule, and of the external semicircular canal for relief of tinnitus and vertigo. *Trans. Otological Society*, United Kingdom, 1905.

346. STEWART. On the membranous labyrinths of certain sharks. *Linnean Society's Journal*, February, 1906.

341. WANNER. A case of bilateral deafness for speech after injury to the skull.

Wanner describes the fate of a man who was injured in a coal mine and in addition to other injuries suffered from a severe lesion of both ears which led to deafness. In the various examinations of the case, an examination of the ear was not made, and no notice was taken of the progressive deafness. At one examination it was noted that the injured man was also deaf but that this deafness was in no relation to the injury.

Twelve years after the injury the existing deafness was referred to the early injury. This view was opposed by an

authority on traumatic neurosis until a careful examination in Bezold's clinic showed the correctness of this diagnosis.

The author pleads for examination of the ear by an aurist in all cases where the patient complains of a disturbance of hearing.

HOELSCHER.

342. GRAY, ALBERT A. *The pathological condition found in a subject who had suffered from deafness during life.*

At a meeting of the British Medical Association held on July 26, 1905, Gray recorded the pathological condition found by him in an individual aged seventy-one years, who for seventeen years had suffered from almost absolute deafness and very severe tinnitus. Death occurred from cancer of the uterus.

The bones of the skull were remarkably soft. The greater part of the temporal bones were also soft in character, and the dense ivory-like capsule of the labyrinth was much reduced in thickness.

The mucous membrane of the tympanum and Eustachian tube was normal throughout. The malleo-incudal joint was ankylosed on the right side but not on the left. On both sides the stapes was completely ankylosed in the oval window, the ankylosis being bony throughout. In the left membranous labyrinth the changes in the bony capsule were found to have produced distortion in the two limbs of the posterior canal by encroaching on its lumen.

The cochlear branch of the auditory nerve was atrophied, at least in the upper two turns of the cochlea. The ligamentum spirale appeared to be of a less dense nature than normal, though this may have been due to old age and not to disease. In the right membranous labyrinth there was found to be no actual distortion. The ligamentum spirale was atrophied, as was also the cochlear branch of the nerve. There were two masses of calcareous deposit; one in the common limb of the posterior and superior canals and the other in the posterior limb of the horizontal canal.

ARTHUR CHEATLE.

343. MCBRIDE, P. *A case of sudden and simultaneous onset of cephalic bruit and deafness.*

A man aged fifty-seven years suddenly became very deaf in the right ear with buzzing tinnitus and without giddiness. The

bone conduction remained. A passing bruit could be heard with a stethoscope placed behind the ear. McBride suggested that it might be due to the sudden occurrence of an aneurismal dilatation of a large vessel so modifying the circulation in the right cochlea.

ARTHUR CHEATLE.

344. HORSLEY, Sir VICTOR, and RUSSELL, RISIEN. *Vertigo, its pathology and treatment.*

The papers and the subsequent discussion require to be read in full.

ARTHUR CHEATLE.

345. LAKE, R. *Case of removal of part of the cochlea, external wall of vestibule, and of the external semicircular canal for relief of tinnitus and vertigo.*

The patient was a woman, aged twenty-six years, who suffered from tinnitus, which prevented sleep; and vertigo, with extreme deafness. After performing the radical operation, Lake removed the external semicircular canal, the outer wall of the vestibule, and cleared out the cochlea as far as possible after opening it. The tinnitus returned slightly on the fourteenth day. After the operation there was no jactitation of the eyes or vertigo; the patient being able to stand up, to turn around either way with the eyes shut, and to pick up an object on the floor on the fifth day after the operation.

ARTHUR CHEATLE.

346. STEWART, CHARLES. *On the membranous labyrinths of certain sharks.*

Stewart has had the opportunity of examining the labyrinths of certain sharks which have not been dealt with by Retzius:

Notidanus friseus.

Fam. Notidanidæ.

Lamargus borealis.

Fam. Spinacidæ.

Lamna cornubica.

Fam. Lamnidæ.

Alopecias vulpes.

Fam. Lamnidæ.

Carcharias lamia.

Fam. Carchariidæ.

The article is illustrated.

ARTHUR CHEATLE.

OTHER EAR AFFECTIONS.

347. STEWART. *A case of non-development of the mastoid process.* *Brain*, 1904.

348. YEARSLEY. A case of "blue membrane." *The Lancet*, February 10, 1905.

349. CHEATLE. A membranous septum in the interior of the lateral sinus. *Trans. Otological Society*, United Kingdom, 1905.

350. PINDER. A vascular intra-tympanic growth, probably an aneurism by anastomosis. *Trans. Otological Society*, United Kingdom, 1905.

351. MILLIGAN. A case of otitis media hæmorrhagica in a male patient suffering from granular kidney and diabetes. *Trans. Otological Society*, United Kingdom, 1905.

352. BRONNER. Notes on a case of severe vertigo, due to aspergillus of the external auditory meatus. *Proc. Otological Society*, United Kingdom, December 4, 1905.

347. STEWART, PURVES. A case of non-development of the mastoid process.

Purves Stewart relates the case of a man in whom the neck muscles on one side were congenitally absent with non-development of the mastoid process.

ARTHUR CHEATLE.

348. YEARSLEY, MACLEOD. A case of "blue membrane."

Yearsley showed a boy aged seventeen at the Otological Society in whom the left membrane was a dark slate-blue color. There was some degree of deafness, but no cause for the condition could be ascertained. The right membrane was normal.

ARTHUR CHEATLE.

349. CHEATLE, ARTHUR. A membranous septum in the interior of the lateral sinus.

The septum was $\frac{1}{2}$ an inch in length and placed vertically, dividing the sinus into two channels.

From a man aged forty years.

ARTHUR CHEATLE.

350. PINDER, T. H. A vascular intra-tympanic growth, probably an aneurism by anastomosis.

A woman aged sixty-four years became slightly deaf with constant tinnitus in the right ear only. Later giddiness and clonic spasm of face and neck with increased pulsating roaring tinnitus. A loud systolic murmur heard over right mastoid, unaltered by moderate compression of carotid.

The membrane retaining its polish was injected; the posterior segment bulged. The outline of the malleus was just

visible but the umbo appeared as a bright yellow dot in a blood-red field. ARTHUR CHEATLE.

351. MILLIGAN, WM. *A case of otitis media hæmorrhagica in a male patient suffering from granular kidney and diabetes.*

Sudden deafness without pain, but accompanied by a dull heavy feeling in the right ear. Middle ear seen to be nearly full of dark reddish exudate. A hemorrhage into retina also occurred. ARTHUR CHEATLE.

352. BRONNER, ADOLPH. *Notes on a case of severe vertigo, due to aspergillus of the external auditory meatus.*

The symptoms were slight increasing deafness of the right ear, with intense tickling for two or three months and attacks of severe vertigo and occasional violent sickness. Recovery was complete after treatment. ARTHUR CHEATLE.

NOSE AND NASO-PHARYNX.

a.—ACCESSORY SINUSES.

353. TURNER and LEWIS. Suppuration in the accessory sinuses of the nose; a bacteriological and clinical research. *The Edinburgh Medical Journal*, November, 1905.

354. GERBER. On the diagnosis of maxillary cysts. Remarks on Professor Chiari's article on the diagnosis of tumors of the maxillary antrum. *Deutsche med. Wochenschr.*, No. 19, 1905; and Prof. Chiari, Wien: "Entgegnung zu vorstehenden Bemerkungen." *Ibid.*, No. 50.

355. NEUFELD. Tuberculosis, syphilis, and suppuration of the maxillary antrum. *Arch. f. Laryngol.*, vol. xvii., book 2.

356. MADER. Radiotherapy in chronic inflammation of the maxillary antrum. *Arch. f. Laryngol.*, vol. xvii., book 2.

357. DENKER. On the radical operation in chronic empyema of the maxillary antrum. *Arch. f. Laryngol.*, vol. xvii., book 1.

358. DELSAUX. The intracranial complications of the accessory sinuses. *La presse otolaryngologique Belge*, 1905, book 8.

359. LUC. A case of suppurative meningitis originating in the frontal sinus cured by the opening of the skull. *La presse otolaryngologique Belge*, 1905, book 9.

360. CHAUVEAU. Syphilitic diseases of the frontal sinus. *Arch. internat. d'otol.*, etc., p. 517, 1905.

361. ONODI. Disturbance of vision and blindness of nasal origin due to disease of the posterior accessory cavities. *Arch. f. Laryngol.*, vol. xvii., book 2.

353. TURNER and LEWIS. *Suppuration in the accessory sinuses of the nose; a bacteriological and clinical research.*

This is a long and interesting paper.

The conclusions arrived at are:

1. That the organisms found in the healthy nasal cavities belong to the same varieties as those occurring in abnormal conditions of the nose.
2. That the pus obtained from some cases of antral suppuration may combine organisms similar to those occurring in the buccal cavity.
3. That occasionally bacilli distinctive of dental caries may be isolated from the pus of an antral abscess.
4. That the healthy accessory sinuses are probably sterile.
5. That there are three main types of organisms commonly met with in suppuration of the accessory sinuses, namely, streptococci, pneumococci, and staphylococci.
6. That in the cases of chronic suppuration streptococci were found in 80 per cent. whilst in the more recent cases they occurred in 60 per cent.
7. That the swabs taken direct from the affected cavities provide from the bacteriological standpoint more trustworthy results than swabs taken in the same cases from the nasal cavities.
8. That in recent cases virulent organisms are met with twice as often as in cases of chronic suppuration.
9. That clinical evidence supports the view that the antrum is more frequently infected by way of the nasal cavity, and that this opinion is corroborated by bacteriological investigation.
10. That nasal polypi occur more frequently in cases of associated sinus suppuration, than in simple cases of antral abscess; their association with ethmoidal cell suppuration, whether occurring alone or as a complication of other sinus inflammation, is evident from the cases quoted.
11. That the recent cases of uncomplicated antral suppuration, as contrasted with those of a chronic type, respond more readily to treatment by lavage. ARTHUR CHEATLE.

354. GERBER. *On the diagnosis of maxillary cysts. Re-*

marks on Professor Chiari's article on the diagnosis of tumors of the maxillary antrum.

Gerber believes: 1. Hydrops of the antrum of Highmore is a disease which has not been demonstrated. The condition is usually a maxillary cyst. 2. Ectasia of the maxillary antrum is never caused by an acute or chronic inflammation but by a distended maxillary cyst. This is also objected to by Chiari, based on the observations of Hartmann, Zuckerkandl, Hajek, and Killian. 3. All maxillary cysts can be recognized by rhinoscopic examination because they cause the floor or the lateral wall of the nose to bulge in the region of the anterior insertion of the lower turbinal. Chiari does not deny this, though he objects to the general correctness of the above-mentioned observations. He found this distension in fourteen cases, among fifty persons who were not suspected of having maxillary cysts, which is not remarkable in view of the well-known asymmetry of the nasal cavities.

NOLTENIUS.

355. NEUFELD. *Tuberculosis, syphilis, and suppuration of the maxillary antrum.*

Two cases are described. In the first a tuberculous alveolus had led to a maxillary tuberculosis. In the other an empyema of the maxillary antrum with the formation of fistula in the mouth resulted from a gumma and sequestrum in the facial bony wall.

ZARNIKO.

356. MADER. *Radiotherapy in chronic inflammation of the maxillary antrum.*

A careful and interesting description of the attempts to influence the mucous membrane of the maxillary cavities by light therapy. Strebel's light proved to be unsuited. Better results were obtained by an induction-light apparatus invented by the author. The reader receives the impression that the results are not commensurate with the expense of time and trouble.

ZARNIKO.

357. DENKER. *On the radical operation in chronic empyema of the maxillary antrum.*

This is a combination of various methods and consists in a large incision through the mucous membrane extending

from the wisdom tooth to the middle line. The periosteum is retracted from the facial wall, and the mucous membrane is detached from the nasal wall in the region of the lower meatus and the floor of the nose. Broad opening of the maxillary antrum starting in the canine fossa. Removal of all diseased parts. The bony wall between the lower meatus and the antrum is removed. A right-angled flap of mucous membrane is reflected in the region of the lower meatus. The wound of the oral mucous membrane is sutured. The cavity is packed from the nose with vioform gauze for four days. Then subsequent treatment by irrigation and the insufflation of powder.

ZARNIKO.

358. DELSAUX. *The intracranial complications of the accessory sinuses.*

Delsaux gives in an interesting paper a short description of the literature. After referring to the statistics of Hajek, he found that the frontal sinus caused the greatest number of intracranial complications; then follow in order the sphenoidal cavities, the ethmoidal cells, and finally the antrum of Highmore. According to Hajek, purulent meningitis is the most frequent complication; then follow in frequency brain abscess, sinus thrombosis, extra- and intra-dural abscesses. Processes which run an extremely rapid course can be distinguished clinically. In these the infection extends along the lymphatics, while subacute processes extend along the venous channels. These two paths are carefully examined and elucidated by excellent drawings. It is further stated that an infection of the endocranium can take place from the accessory sinuses by a direct way through defects in the bone, which may be normal or pathologic. Pathological descriptions are added which are taken from Hajek's paper, and finally a chapter is devoted to the nature of the carriers of infection. After giving his conclusions, the author discusses the treatment, which depends, as Luc has stated, upon the localization and the nature of the complications present.

In the cases of meningitis an extensive trephining must be undertaken, which must include the posterior wall of the frontal sinus. The cerebral membranes are to be incised in order to give vent to the serous or purulent secretions.

Drainage. Operation should be preceded by lumbar puncture in order to avoid cerebral hernia. The extradural abscess is treated in a similar manner. In brain abscesses puncture should not be made through the membranes, but these should be incised and then puncture should be practised with the blade of a knife. Thrombophlebitis, according to Lermoyez, is a contra-indication for operative treatment.

This paper is one of the two principal papers read at the last meeting of the Belgian Society for Otology. BRANDT.

359. LUC. *A case of suppurative meningitis originating in the frontal sinus cured by opening of the skull.*

A very extensively reported case of purulent inflammation of the frontal sinus with intracranial complications and purulent meningitis was cured by three extensive operations. An acute frontal suppuration led to retention of pus and inflammation of the bone in the surrounding parts, necessitating an extensive exposure of the focus. The osteomyelitis continued. Cause, subperiosteal extradural abscess and a purulent infection of the arachnoid in the parietal region. A fistula in the dura led to the discovery of this last severe complication, which was cured by opening the dura and by disinfection of the affected region. BRANDT.

360. CHAUVEAU. *Syphilitic diseases of the frontal sinus.*

A patient thirty-eight years of age suffered for five months from a right-sided suppuration of the frontal sinus which, in addition to a profuse discharge from the nose, caused occasional severe headache. Irrigation practised every two days and continued for months, as well as numerous small intranasal operations, were without result, and the radical operation was suggested. The patient was timid and consulted Chauveau, who elicited the history of syphilis affecting the mouth seventeen years before, and for which the patient had undergone treatment with mercury. Without treating the nose, mercury was again prescribed. After ten injections the headache had disappeared and the suppuration was less. Complete permanent recovery after twenty-five injections.

OPPIKOFER.

361. ONODI. *Disturbance of vision and blindness of nasal origin due to disease of the posterior accessory cavities.*

This is an exhaustive description of the relations between the posterior ethmoidal cells and the sphenoidal cavity and the optic canal, which the author has previously described a number of times. Enumeration of many actual observations in which affections of the accessory cavities of the nose have led to diseases of the optic nerve. Description of anatomic conditions of importance in the extension of the disease (semicanalis ethmoidalis Onodi; vascular furrows and emissaries in the anterior lateral wall of the sphenoidal cavity). Discussion of the crossed affections (left-sided nasal affection with a right-sided lesion of the optic nerve, and the opposite). A careful preparation and a general rearrangement of the material would, in the opinion of the reviewer, have been of advantage to this important and instructive paper.

ZARNIKO.

b.—OTHER AFFECTIONS OF THE NOSE.

362. SIEGEL. *Acute rhinitis. Terapija*, August, 1905.

363. KOENIG. The cure of a case of vasomotor rhinitis by the administration of weak doses of iodide of potash. *Arch. intern. d'otol.*, etc., vol. xx., p. 470, 1905.

364. E. VON TÖVÖLGYI. A new operative treatment for hypertrophy of the nasal turbinals. *Arch. f. Laryngol.*, vol. xvii., book 2.

365. MIODOWSKI. On involvement of the nasal mucous membrane in septic conditions, and report of a case of uncontrollable epistaxis. *Arch. f. Laryngol.*, vol. xvii., book 2.

366. SCHILLING. On the bacterial diagnosis of rhinoscleroma. *Arch. f. Laryngol.*, vol. xvii., book 2.

367. DOWNIE. A case of nasal obstruction from an unusual cause. *Lancet*, November 11, 1905.

362. SIEGEL. *Acute rhinitis.*

In addition to the rules of caution and the well-known applications of cocain and menthol, the author recommends tampons with a 1 : 5000 adrenalin solution, which arrests the discharge in from one to two hours. This same treatment is recommended for the coryza of the new-born. In hay fever Dunbar's serum is applied with benefit. SACHER.

363. KOENIG. *The cure of a case of vasomotor rhinitis by the administration of weak doses of iodide of potash.*

A young woman twenty-three years of age had suffered for two years from continuous discharging rhinitis (repeated

attacks of sneezing, excessive outflow of watery fluid, obstructed nasal respiration, headache, and lachrymation). Change of climate without benefit. Interior of the nose normal. Many forms of treatment, such as cauterization, hot air, adrenalin, orthoform, arsenic, etc., without avail. Immediate recovery after the use of iodide of potash (0.5 per day).
OPPIKOFER.

364. E. VON TÖVÖLGYI. *A new operative treatment for hypertrophy of the nasal turbinals.*

This operation consists in the use of simple straight surgical scissors instead of bent ones. The thumb is placed in the lower, the index finger in the upper opening, the other fingers on the branches. The operation is thus easily performed.
ZARNIKO.

365. MIODOWSKI. *On involvement of the nasal mucous membrane in septic conditions, and report of a case of uncontrollable epistaxis.*

In this patient, observed in Brieger's clinic, general sepsis developed from a severe ulcerating angina. Profuse epistaxis accelerated death. Examination showed that the blood-vessels and the nasal mucosa were filled with diplococci and staphylococci. The vessels were thrombosed and some ruptured, causing the unfortunate hemorrhage. Another case is reported of severe sepsis following ulcerating angina in which the nasal mucous membrane was affected secondarily to the tonsils.
ZARNIKO.

366. SCHILLING. *On the bacterial diagnosis of rhinoscleroma.*

In a patient with a clinical picture of rhinoscleroma many virulent diphtheria bacilli were found in smears taken from the diseased mucous membrane. The blood serum of the patient exhibited pronounced antitoxic properties. Microscopic examination of a small portion of the affected tissue confirmed the first diagnosis. This was a case of chronic diphtheria added to primary rhinoscleroma.
ZARNIKO.

367. DOWNIE. *A case of nasal obstruction from an unusual cause.*

A man suffering from cicatricial results of tertiary nasopharyngeal and nasal syphilis complained of nasal block. The free border of the soft palate and uvula were curved upwards and the enlarged uvula lay against the posterior walls with the tip directed upwards, producing the obstruction.

ARTHUR CHEATLE.

C.—NASOPHARYNX.

368. CHAUVEAU. Rapid retrogression of adenoid vegetations following measles. *Arch. internat. d'otol.*, etc., No. 6, p. 873, 1905.

369. SCHEIER. On the condition of the blood in children with adenoid vegetations. *Zeitschr. f. klin. Med.*, vol. lviii., books 3 and 4.

370. GAVELLO. An unusual affection of Rosenmüller's fossa as the cause of fœtor ex ore. *Archivio italiano di otologia*, etc., vol. xvii., book 2.

371. BOBONE. Healing of a case of tuberculosis of the tonsils, uvula, pharynx, and nasopharynx with methylene blue. *Archivio ital. di otologia*, etc., vol. xvii., book 2.

372. MANGERI. A leech in the nasopharynx. *Arch. internat. d'otol.*, etc., 1905, No. 5.

373. COMPAIRED. On the clinical study of malignant tumors of the nasopharynx. *Arch. internat. d'otol.*, etc., vol. xx., p. 368.

368. CHAUVEAU. *Rapid retrogression of adenoid vegetations following measles.*

A child ten years of age suffered from adenoids of a moderate degree and their removal was recommended. The operation was postponed because the child suffered from measles and severe pneumonia. A few months later the patient returned and the adenoids had disappeared. A similar spontaneous retrogression of adenoid vegetations had been observed by the author in three other patients who had been taken ill with the grip. The reviewer observed recently a case of moderate adenoids, causing nasal obstruction and catarrh in the nose and ear for one year, disappear completely after a general illness—scarlet fever and nephritis—which lasted two months.

OPPIKOFER.

369. SCHEIER. *On the condition of the blood in children with adenoid vegetations.*

An examination of the blood of twenty-one children was made. After extirpation of the hypertrophied pharyngeal tonsil the large lymphocytes increase just as the small

lymphocytes decrease in number. An unusually favorable influence is exerted upon the blood by this operation if the children are subsequently sent to the country for four or five weeks.

BRUEHL.

370. GAVELLO. *An unusual affection of Rosenmüller's fossa as the cause of fœtor ex ore.*

In a patient fifty-eight years of age suffering from fœtor a cheesy mass was found in one of Rosenmüller's fossæ. The condition was removed. Directly after its removal microscopic examination showed the presence of the bacillus fluorescens putridus.

RIMINI.

371. BOBONE. *Healing of a case of tuberculosis of the tonsils, uvula, pharynx, and nasopharynx with methylene blue.*

A patient fifty-four years of age was suffering from pulmonary tuberculosis. A tuberculous ulcer occupying the entire posterior wall of the pharynx, the palatal tonsils, and the nasopharynx was curetted with a sharp spoon and treated with a 50 per cent. solution of lactic acid and a 2 per cent. watery solution of methylene blue. These applications were frequently repeated. Recovery after two months.

The author is inclined to believe that the rapid success of the treatment was due to the action of the methylene blue, because the treatment with lactic acid usually is a very much slower one.

RIMINI.

372. MANGERI. *A leech in the nasopharynx.*

An Italian farmer thirty-four years of age had been suffering for eight days from epistaxis and difficulty in swallowing. A posterior rhinoscopy showed the presence of a leech on the posterior surface of the vomer.

Leeches not infrequently get into the upper respiratory passages in Sicily, as the peasants do not use glass drinking-vessels and usually drink directly from the spring.

OPPIKOFEK.

373. COMPAIRE. *On the clinical study of malignant tumors of the nasopharynx.*

The author has observed an unusual number of malignant diseases of the nasopharynx (since 1897, twenty cases).

Sarcoma is more frequent than carcinoma, and they have occurred in eleven women to nine men. The sarcomata develop generally from the posterior pharyngeal wall, while the carcinomata arise from the region of the Eustachian tube or the choanæ. In the beginning stages of the carcinomata the neighboring glands are involved; this occurs at a much later period in the sarcomata, at the time of ulceration. The author has observed recovery in no case whether by operation or any other treatment.

OPPIKOFER.

PALATE, PHARYNX, AND BUCCAL CAVITY.

374. COLLET and TROULLIEUR. *Congenital perforation of the posterior pillars of the fold of the palate.* *Arch. internat. d'otol., etc.*, 1905, p. 516.

375. KOTSCHANOW. *On the treatment of acute retropharyngeal abscesses.* *Russki Wratsch*, 1905, No. 23.

376. REUTER. *Hardy pharyngeal polypi.* *Arch. f. Laryngol.*, vol. xvii., book 2.

377. HALKIN. *On the ossification in the tonsils.* *La Presse otolaryngologique Belge*, 1905, book 10.

378. HOPE. *Tonsillectomy.* *Arch. internat. d'otol., etc.*, vol. xx., p. 466.

374. COLLET and TROULLIEUR. *Congenital perforation of the posterior pillars of the fold of the palate.*

The author has observed accidentally in a man eighty-two years of age two congenital defects in the left posterior palatal arch and one large defect in the right. OPPIKOFER.

375. KOTSCHANOW. *On the treatment of acute retropharyngeal abscesses.*

Acute retropharyngeal abscesses occur most frequently in children between six months and a year and a half old. Catarrhs of the upper air passages and aural suppurations are the chief causes. The pus generally contained streptococci. With the retropharyngeal abscesses the anterior glands are enlarged and break down. Treatment can only be surgical. The opening of the abscess from the pharynx can only be performed in a small number of cases where the abscess is small and the situation is high up. The majority should be opened from the neck, and the cervical lymphatics should be removed at the same time.

SACHER.

376. REUTER. *Hairy pharyngeal polypi.*

Nineteen cases are collected from literature, with the addition of one personally observed case. The anatomy, origin, and clinical symptoms are described. ZARNIKO.

377. HALKIN. *On the ossification in the tonsils.*

The author believes that the ossification of the cartilaginous rudiments in the palatal tonsils occurs as in the case of the bones of the skeleton, by means of periostitic ossification which is preceded by indirect ossification. This development does not agree with the view of the metaplastic origin. The presence of a small cyst originating from the second branchial cleft shows that there must be a disturbance in development of the branchial apparatus. These features observed in the tonsil do not confirm Cohnheim's theory on the origin of tumors. BRANDT.

378. HOPE. *Tonsillectomy.*

Hope believes that in disease of the tonsils tonsillectomy should be more frequently practised. After-hemorrhages are rare. In two thousand tonsillectomies hemorrhage severe enough to be noted was observed in only two.

In the opinion of the reviewer, after-bleeding depends upon whether the patient is a child or an adult. In the latter hemorrhage occurs very much more frequently than in 1:1000 cases, and too great operative fervor is to be deprecated. The reviewer is also of the opinion that in general practice the palatal tonsils are too frequently removed and the adenoids allowed to remain. OPIKOFER.

REPORT ON THE PROGRESS IN OTOTOLOGY DURING THE FIRST QUARTER OF THE YEAR 1906.

BY PROF. ARTHUR HARTMANN, BERLIN.

Translated by Dr. ARNOLD KNAPP.

GENERAL.

a.—REPORTS.

1. MAGNUS. Report on the otological division of Professor Gerber's clinic in the year 1904. *A. f. O.*, vol. lxvii.

2. FALLAS. The statistics of the otolaryngological service in the St. John's Hospital in Brussels. *La Presse otolaryngologique Belge*, books 1 and 2, 1906.

1. MAGNUS. *Report on the otological division of Professor Gerber's clinic in the year 1904.*

4530 patients were treated, presenting 6867 affections, of which 2027 belonged to the ear and 2515 to the nose and pharynx. Of interest is a myxofibroma which completely occluded the antrum and aditus. A report follows of two cases of labyrinth caries and three cases of severe pyemia which recovered, four cases of sinus thrombosis without characteristic temperature curves and four deaths.

ZARNIKO.

2. FALLAS. *The statistics of the otolaryngological service in the St. John's Hospital in Brussels.*

In 1905, 14,186 patients were treated. Of these 2422 were new patients and 1471 were referred from other departments.

Of interest were: 1. A case of mastoiditis, operation, immediate suture, recovery in eight days. 2. Subacute mastoiditis, extradural abscess, recovery. 3. Mastoiditis, cholesteatoma, extradural abscess, meningitis, secondary suture, recovery. 4. A carcinoma of the ear simulating

Bézold's mastoiditis. 5. A woman who was operated on for chronic mastoiditis returned six months later complaining of vertigo and vomiting. An operation was not necessary as the symptoms were referable to chronic gastritis. 6. A case of tuberculosis of the nose with multiple surgical operations. In six cases of disease of the accessory cavities of the nose external operations were performed in five, one was treated intranasally. The result in four cases was favorable. Finally a case of syphilitic tumor at the inner angle of the eye is reported.

BRANDT.

b.—GENERAL PATHOLOGY AND SYMPTOMATOLOGY.

3. HOŘČLČKA and POLEDUE. Two cases of cerebro-spinal meningitis with report of the nasal examination of a number of healthy persons regarding the presence of a micrococcus of the type of the meningococcus. *Wiener klin. Wochenschrift*, No. 40, 1905.

4. CORNET. Epiphora of labyrinthine origin. *Arch. internat. d'otol.*, etc., vol. xxi., p. 120.

5. EINIS. Reflex disturbances originating in the nose, ear, and throat. *Wratschebnaja Gasete*, No. 7, 1906.

6. BAUMANN. On the pharyngeal reflex. *Munch. m. Wochenschr.*, No. 13, 1906.

7. VALI. On objective noises of the ear. *A. f. O.*, vol. lxvi., p. 104.

8. LESZYNSKY. Epidemic cerebrospinal meningitis. *Medical Record*, March, 3, 1906.

9. AMBERG. Congenital malformation of the left auricle and of the external cutaneous canal. *Journ. American Medical Association*, December 9, 1905.

10. SHAMBAUGH. A case of vicarious bleeding from the external auditory canal. *Laryngoscope*, January, 1906.

3. HOŘČLČKA and POLEDUE. Two cases of cerebro-spinal meningitis with report of the nasal examination of a number of healthy persons regarding the presence of a micrococcus of the type of the meningococcus.

The nasal secretion in 207 healthy persons was examined who had not come in contact with cases of meningitis. Positive results were found in twenty-five (12 per cent.), while in twenty-nine persons who had come in contact with meningitis patients positive results were found in eleven (37 per cent.). The authors, therefore, are not certain whether in these cases the meningococcus was really present. It might have

been the micrococcus catarrhalis Pfeiffer, because in only a few cases cultures were made, and the diagnosis rested upon tinctorial and morphological data.

In general micro-organisms like the meningococcus do not remain for a long time in the nose of a healthy individual. After meningitis they rapidly disappear in the nasal discharge.

The authors, moreover, found in the nasal secretion of 119 children in the florid stage of measles a positive result in thirty-four.

WANNER.

4. CORNET. *Epiphora of labyrinthine origin.*

This unusual case concerned a soldier twenty-one years of age who suffered from bilateral catarrh of the tubes. If the right handle of the malleus was moved in any way the conjunctiva of the eye on the same side became congested and there was a pronounced flow of tears.

OPPIKOFER.

5. EINIS. *Reflex disturbances originating in the nose, ear, and throat.*

First Case: Repeated epileptic attacks in a man fifty years of age caused by cerumen and cured after its removal.

Second Case: Attacks of asthma cured on removal of a large mucous polyp from the nose.

Third Case: Neuralgia of the fifth nerve healed after removal of moderate nasal polypi and amputation of hypertrophied lower turbinal.

Fourth Case: Chorea in a girl of eleven cured after removal of adenoids.

Fifth Case: Reflex cough caused by adenoids. SACHER.

6. BAUMANN. *On the pharyngeal reflex.*

The author distinguishes between the pharyngeal and the palatal reflex. The former was tested on 430 soldiers and 155 students. The relation of the normal reflex to the diminished and to the increased one was, in the case of the soldiers, 6.5 : 3 : 1, in the students 2.5 : 1 : 1.5. The reflex was absent in only one case.

In chronic pharyngeal catarrh no increase was observed. In hypertrophy of the tonsils a diminution was very seldom seen. These results do not agree with the observations of

the reviewer. In hysteria the reflex was frequently decreased and sometimes absent.

SCHIEBE.

7. VALI. *On objective noises of the ear.*

Objectively perceived entotic noises and sounds develop most frequently from an abnormality of the circulation or by tonic and clonic contractions of the muscles in the tympanum and in the pharynx. In the case reported the tone was a c^5 synchronous with the pulse arrested by depression of the tongue, by elevation of the soft palate, by catheterizing the tube but not influenced by pressure on the carotid. At the same time there was no movement of the drum membrane or variation in pressure in the external canal to be observed. This leads the author to regard chronic contraction of the tensor veli and palati muscle as responsible, and the sound as not produced directly by the muscle but owing to the contractions of the muscles there are changes in position, friction and various alterations in the condition of the air column which produce the tone.

HAENEL.

8. LESZYNSKY. *Epidemic cerebro-spinal meningitis.*

Out of fifty cases seen by the writer, five thereof had involvement of the auditory nerve. In the first case observed, deafness occurred in the left ear on the fifteenth day and was permanent; in the second case bilateral deafness took place on the first day, complete and remained permanent; in the third case, bilateral deafness was noticed on the tenth day which remained complete and permanent in the right, the left recovered; in the fourth case bilateral deafness was noticed on the seventh day which remained permanent in the right, the left recovered; in the fifth case, deafness was noticed on the seventh day in the right ear. It is considered that the permanent deafness in these cases was due to infiltration and destruction of the auditory nerve.

CLEMENS.

9. AMBERG. *Congenital malformation of the left auricle and of the external cutaneous canal.*

The left auricle shows arrested development. The ridge measures 4.6cm long, the width varies from 11 to 7mm, and the height from 7 to about 5mm. There are four distinct blind canals, two being found in the anterior fold between the

cartilage and the skin, the first of which measures 11mm, from the top and about 5mm deep, the second 28mm from the top and about 7mm deep. The third canal is in the middle of the ridge about 13 mm from the top, and the fourth one is in the posterior fold 22.5mm from the top neither of which shows any depth. In addition there are slight intimations of two shallow canals in the posterior fold, one 29 and the other 34mm from the top. The osseous canal seems filled with fibrous and cartilaginous tissue. The mastoid is well developed. The acoumeter is heard about one inch and by bone conduction. Middle tones not heard by air conduction but by bone conduction; high tones not heard by air or bone conduction. No hereditary history.

CLEMENS.

10. SHAMBAUGH. *A case of vicarious bleeding from the external auditory canal.*

Case, female, married, aged twenty-five, had had the initial hemorrhage from the right ear five years prior to consultation. Similar attacks have occurred at irregular intervals since, usually preceding the menstrual flow by one or two days, which was correspondingly diminished and not infrequently absent. During these five years attacks of furuncle were noted several times. Examination showed the canal to be partially obstructed by a swelling of the upper wall just inside the meatus which is smooth and covered with normal skin. The hemorrhage is from a point at the lower tip of the swelling. Treatment with chromic acid eventually brought much relief. There is also a history of superficial ulceration of the canal external to the swelling which rapidly involved the concha and the lobe. The ulcer was pronounced specific and rapidly healed under the influence of potassium iodide.

CLEMENS.

C.—METHODS OF EXAMINATION AND TREATMENT.

11. OSTMANN. Clinical studies on analysis of disturbances of hearing. Part IV.: The curve of sensitiveness of the ear made deaf by nervous disturbances, and its relation to the determination of the acuity of hearing according to the principle of Conta-Hartmann. *A.F.O.*, vol. lxi.

12. LUCAS. Errors in the examination of the deaf with tones and

several physiological remarks on acoustics. *Deutsche med. Wochenschr.*, No. 9, 1906.

13. UFFENORDE. On the auscultation of the middle-ear cavities. *A. f. O.*, vol. lxvi., p. 1.

14. LAVAL. Nasal auscultation of the ear during catheterization. *A. f. O.*, vol. lxvi., p. 120.

15. GERSUNY. Excitement during narcosis. *Wiener klin. Wochenschr.*, No. 3, 1906.

16. BLEGVAD. On Rinne's test and the determination of the hearing by the perception of tuning forks. *Nord. med. Arkiv.*, 1905, vol. i., book 2.

17. KUTVIRT. On airoi as a diagnostic help in carious disease of the ear. *Wiener klin. therapeutische Wochenschrift*, Nos. 5 and 6, 1906.

18. HAMM. Artificial drums of paraffin. *Deutsche med. Wochenschr.*, No. 8, 1906.

19. HALBHUBER. Therapeutic notes. *Wiener med. Presse*, No. 48, 1904.

20. MÜLLER. On the hemostatic action of paranephren. *Wiener klin. therapeutische Wochenschrift*, No. 2, 1906.

21. RETHI. Remarks on Sondermann's paper: a new method for the diagnosis and treatment of diseases of the nose. *München. med. Wochenschr.*, 1906, No. 4.

22. LEUWER. A new nasal aspirator. *Deutsche med. Wochenschr.*, No. 10, 1906.

23. LAURENS. The aspiration of blood in surgery of the ear, nose, and throat. *Arch. internat. d'otol.*, etc., vol. xxi., p. 174.

24. BARDES. Earache. *Medical Record*, January 20, 1906.

25. MCSHANE. New and rational operation for the correction of prominent ear. *Indiana Medical Journal*, February, 1906.

26. GOLDSTEIN. The oto-projectoscope. *Laryngoscope*, February, 1906.

27. FRIDENBERG. Aspiration of the tympanic cavity after paracentesis; a valuable aid in the treatment of acute otitis media. *Medical Record*, March 3, 1906.

II. OSTMANN. *Clinical studies on analysis of disturbances of hearing. Part IV.: The curve of sensitiveness of the ear made deaf by nervous disturbances, and its relation to the determination of the acuity of hearing according to the principle of Conta-Hartmann.*

This paper is hardly suited to a short review, especially as Ostmann gives his results in the last number of this publication under the title, *From Objective to Uniform Measure of Hearing*, vol. li., No. 3. ZARNIKO.

12. LUCAE. *Errors in the examination of the deaf with tones and several physiological remarks on acoustics.*

Lucae believes that Bezold is incorrect in assuming that the weighted tuning fork and covered organ pipes furnish the purest tones because they possess the fundamental tone without any overtones. By the aid of Quincke's interference apparatus, which instrument is described in the text, the proof is easily furnished that in every fork the high octave is distinctly heard. This can be even better demonstrated by means of a suitable resounder. The overtones, in the case of unweighted forks, will become distinct to an entire auditorium. Lucae has recently succeeded in making the higher octaves very distinct by the use of paper and resonators in the case of Edelmann's forks. The author believes that he has thereby discovered a source of error, because a deaf person may perceive the higher octave instead of the fundamental tone and thereby mislead the examiner. The presence of islets and gaps in the tone scale can only be referred to disease of the labyrinth, when the diseased ear, even if a suitable resounder is used and by the loudest blow of a large fork, would no longer perceive the given tone. According to Lucae this also has some prognostic importance. According to his experience treatment is absolutely valueless when the resonator tone is absent, while in other cases, as for instance in the after-treatment of those radically operated upon and in many cases of so-called sclerosis, an improvement in the hearing is possible. Consequently an examination with tuning forks should be practised if the examiner has determined with the aid of resonators the duration of the overtones and makes the examination with the fundamental tone after these overtones have died out. It must be taken for granted that the tuning-forks are all struck with equal intensity. This Lucae obtains by an attached mechanism for his weighted c-fork. Finally he draws attention to the air noise produced by blowing into a Galton's whistle which may lead to a confounding with the original tone, and recommends Koenig's rods.

NOLTENIUS.

13. UFFENORDE. *On the auscultation of the middle ear.*

This paper resulted from the contradictory condition found in two cases between the result on auscultation during catheterization (crepitant râles suggestive of an exudate

in the tympanum) and the actual condition in the middle ear as shown on paracentesis (no fluid whatever). After quoting the generally accepted views on auscultation of the middle-ear cavities, the author describes his own investigations which were made partly on cadavers shortly after death and partly on disarticulated temporal bones. He comes to the following conclusions:

1. During auscultation of the middle ear with the otoscope it is impossible to determine the localization, whether the noise is far from or near the ear of the observer. Audible noises heard at a distance are produced in front of the tube. They may be present in the tube or in the tympanum and nevertheless sound distant.

If a marked obstruction for sound waves is situated in their path, an auscultation murmur is only perceptible if between the end of the catheter and the drum of the observer there is no plastic obstruction which causes the sound waves to be absorbed or reflected.

2. The vesicular murmur is produced principally at the end of the catheter and at the walls of the tube. The tympanum serves as a resounder.

3. The musical character of the crepitant râles does not tell us about the consistency of the secretion.

4. Crepitant râles produced in the tympanum must be explained by simple change in position of the secretion. They will be characterized by unusual intensity of sound and by a musically lower character, especially the after murmur, which means that the secretion has fallen back into its original position. The tubal noises are musically higher and less loud, corresponding to the smaller amount. The bursting of air bubbles can only explain a part of the secondary noises.

5. If on catheterization in a moist catarrh there is an auscultation murmur, the obstruction is probably to be found in the tube.

6. Removal of the discharge from the tympanum in other favorable conditions and when the drum is intact takes place to a certain degree through the tube into the epipharynx. If the collection of discharge is very slight then its distribution comes into importance.

7. As regards the perforation murmur, the presence of whistling denotes secretion but not necessarily the size of the perforation. A drum is not absolutely necessary to produce a perforation murmur. HAENEL.

14. LAVAL. *Nasal auscultation of the ear during catheterization.*

Laval employs nasal auscultation for the more exact localization of the origin of murmurs heard during the catheterization of the tube in addition to the auscultation of the ear. This consists in the introduction of a hearing tube 2-3cm obliquely and upwards into the opposite nose.

His conclusions are as follows:

Noises produced at the tubal ostium are heard very loud through the nose, while with the ear they are perceived as indistinct, distantly situated, and hollow.

Murmurs produced in the tube can be perceived by both ear and nose and in about the same intensity.

Noises which take their origin in the tympanum can only be perceived by the ear.

If there is a slight amount of exudate in the tympanum, crepitant râles occasionally occur on bending the head of the patient during catheterization (removal of exudate through the tube). The contact murmur is produced in the tympanum at the moment of the greatest tension of the drum membrane. Nasal auscultation tells us of the removal of secretion from the tympanum through the tube. The greatest part of the crepitant râles is not produced in the tympanum but by the escape of exudate along the tube. The blowing noise is produced in the cartilaginous part of the tube. Its character depends upon the form of the tubal secretion. Rough blowing murmurs are produced by swelling and moisture in the tubal mucous membrane. HAENEL.

15. GERSUNY. *Excitement during narcosis.*

The struggling and the sense of resistance make the patient restless during narcosis. It seems, therefore, well to not prevent his movement with force. After the first inhalations sleeves of celluloid are put on the arms of the patient, so that the arms may be moved but may not reach the mask.

The nurse prevents a patient from raising himself up by simply putting the flat hand under the heels and lifting the feet up from the table. WANNER.

16. BLEGVAD. *On Rinne's test and the determination of the hearing by the perception of tuning-forks.*

The author states that if Rinne's experiment is made according to Bezold's description its value is reduced compared with the difference between air conduction and bone conduction. Moreover, as Moeller has shown, the same ear may present a positive and negative Rinne. He believes that Rinne's experiment, therefore, in its old form is useless, and is in favor of Ostmann's suggestion to determine air conduction and bone conduction separately. He always uses two forks, a simple a-fork and a Koenig's A-fork, which are struck by means of a pendulum apparatus. Towards the end of the period of vibration the fork is placed in front of the ear, so that the ear does not become over-fatigued. The best site for bone conduction is the mastoid fossa. It is impossible to isolate the two ears for bone conduction, because in the case of prolonged hearing of one ear the examination of the other ear is unreliable, as in the cases of cerumen when the bone conduction was found prolonged on both sides. The bone conduction can be just as well determined from the vertex after Schwabach's method. JOERGEN MOELLER.

17. KUTVIRT. *On airol as a diagnostic help in carious diseases of the ear.*

Kutvirt recommends airol as an aid in diagnosis in ear diseases because when this remedy turns brown or black a carious process is to be suspected. WANNER.

18. HAMM. *Artificial drums of paraffin.*

In order to protect large dry perforations of the drum membrane and tympanum from water and injury, Hamm recommends the use of a large sterilized piece of gauze soaked in hard paraffin, which is quickly put in place and allowed to harden. These artificial drums have the advantage of absolute freedom from irritability, and they not infrequently produce a marked improvement in hearing. The danger of retention of pus is excluded in possible relapses of the otitis.

because the pus would displace the paraffin and force it into the auditory canal.

NOLTENIUS.

19. HALBHUBER. *Therapeutic notes.*

Halbhuber paints the tubal ostium with Manoll's solution when catarrhal affections in the pharynx produce subjective tinnitus.

WANNER.

20. MÜLLER. *On the hemostatic action of paranephrin.*

As a hemostatic Müller has employed the impregnated suprarenin and adrenalin gauze. By this means these preparations are brought in definite amounts near the wound and the action is kept up for a longer time.

WANNER.

21. RETHI. *Remarks on Sondermann's paper: A new method for the diagnosis and treatment of diseases of the nose.*

Rethi mentions that Seifert and he have drawn attention to the diagnostic and therapeutic value of this method years ago.

SCHEIBE.

22. LEUWER. *A new nasal aspirator.*

In order to remove discharge from the nose and from the accessory cavities, two glass olives are introduced into the nasal openings, which are connected by rubber tubes with a double metallic tube. The suction is produced by a pump, while the patient at the same time closes his soft palate in taking a deep inspiration after pronouncing the consonant "K." This apparatus is better than Sondermann's because it can be disinfected, and it is applicable to persons of all ages.

NOLTENIUS.

23. LAURENS. *The aspiration of blood in surgery of the ear.*

To facilitate the arrest of discharge and to prevent in certain cases aspiration of blood into the upper air passages, Laurens has suggested the following apparatus. This consists of a large receiver which was made air-tight. A large cannula connected by means of a tube with the receiving vessel aspirates the blood from the field of operation.

OPPIKOFER.

24. BARDES. *Earache.*

It is recommended that as soon as earache begins the

patient should be kept quiet, put to bed, and placed upon fluid diet, and in other ways treated like a patient with high fever. The bowels should be kept open, and he suggests that a single dose of morphia may be given to ensure rest and comfort. Dry heat or else an ice-bag may be applied, although the former is more acceptable to most patients. Irrigation with hot bi-chloride solution, 1. to 5000, should be given every three hours, after which a few drops of a 12 per cent. carbol-glycerine solution may be instilled. No case should be allowed to suffer longer than twenty-four hours. If the pain continues and the drum-head is inflamed and bulging, it should be freely incised rather than simply punctured or allowed to break. The utmost care and cleanliness should be exercised in making the incision, lest a mild infection be converted into a more serious one from without.

CLEMENS.

25. McSHANE. *New and rational operation for the correction of prominent ear.*

The auricles of this case extended at right angles from the head and measured at the distal margin one inch and three-quarters. An elliptical section of integument two inches in length and something more than half an inch in width was removed from the posterior surface of the auricle. The connective tissue was then carefully dissected away and the perichondrium roughened by the use of a curette. Strong catgut sutures were used in the cartilage in such a manner as to fold it on itself. The needle was introduced into the cartilage near the margin of the denuded area and thrust in as deeply as possible, care being taken not to pierce the skin on the anterior surface of the auricle. The needle was returned and brought out an inch and a half from the point of insertion. The needle was then carried across the denuded surface and similar hold was taken near the margin of the skin on the opposite side. Four or five of these sutures were introduced, and when they were tied the ear presented the normal anterior ridge in its proper position, the ear was contracted to its proper size and brought back to the proper distance from the head. Silk sutures were used to bring the margins of the skin together, and the catgut sutures were buried. The ears were dressed with cotton compresses and bandaged

as close to the head as possible to relieve the sutures of any undue tension. After two weeks the ears are normal in appearance and size.

CLEMENS.

26. GOLDSTEIN. *The oto-projectoscope.*

This apparatus is designed to demonstrate the various pathological conditions seen on the membrana tympani and at the fundus of the auditory canal by projecting the exact image thereof on a small screen. The size of the image is about four (4) cm in diameter at the most brilliant focal point. The instrument is also available for demonstrations in nasal and pharyngeal diseases.

CLEMENS.

27. FRIDENBERG. *Aspiration of the tympanic cavity after paracentesis; a valuable aid in the treatment of acute otitis media.*

The procedure suggested by Fridenberg is the evacuation, by suction, of the tympanic cavity immediately after cutting the drum. He uses a small glass bulb about five-eighths of an inch wide, shaped like an olive with a very blunt tip. The neck of the glass bulb is stuffed with sterile cotton and attached to a short rubber tube after both bulb and tube have been boiled. Immediately after paracentesis the glass bulb is pressed against the external meatus, plugging the canal hermetically. Suction is then applied and gradually increased until there is a flow of fluid from the middle ear. The effects of this aspiration by energetic suction are strikingly gratifying. There seems not only to be less pain after the paracentesis than when an incision only is made, but the otitic pain is more promptly and lastingly relieved. A second incision of the drum is less often required, and the drainage is much more free. This method also has certain diagnostic features, particularly in very young children and infants, proving that the incision was thorough and free.

CLEMENS.

d.—DEAFMUTISM.

28. HELLER. *Two cases of aphasia in childhood. Wiener klin. Rundschau, No. 42, 1905.*

28. HELLER. *Two cases of aphasia in childhood.*

1. Deafness. A girl six years of age who had suffered

from convulsions at the age of two weeks does not speak and does not repeat, though comprehension for speech has existed since the second year. After instruction over a short period of time, the child had advanced so that she could attend the public schools.

2. Sensory aphasia. A boy ten years of age, premature birth, repeated convulsions continuing during the first and second years; learned to walk late. After instruction of about two years' duration, principally in writing and reading the knowledge of speech is relatively good.

Heller warns physicians and teachers of making the diagnosis of idiocy prematurely in children with disturbances of speech.

A similar warning the reviewer would like to make in regard to the diagnosis of deafness and aphasia when, as in the above cases, an exact functional examination with the continuous tone series is absent.

WANNER.

EXTERNAL EAR.

29. FOLKEL. A hollow needle to perforate the lobule of the ear. *Wiener klin. Rundschau*, No. 7, 1906.

30. VOSS. On the etiology of othematoma. *A. f. O.*, vol. lxvii.

31. VOERNER. On lymphangiectomia of the auricle. *München. med. Wochenschr.*, 1906, No. 9.

32. DELSTANCHE. Mastoiditis and furunculosis. *La Presse otolaryngologique Belge*, 1906, book 3.

33. WILLAUME-JANTZEN. Communication from the aural clinic of the military hospital in Copenhagen. *Militärlägen*, 1905, p. 201.

29. FOLKEL. A hollow needle to perforate the lobule of the ear.

This needle consists of a metal cannula $2\frac{1}{2}$ cm long upon which is a short trocar. After perforating the ear the trocar is withdrawn and the earring introduced through the cannula. If there is any infection the cannula is replaced by a thread of 10 per cent. dermatol.

WANNER.

30. Voss. On the etiology of othematoma.

The author believes that in othematoma we have the condition described by Morel-Lavallée as traumatic detachment of the skin and the underlying tissues. This affection was later examined by Gussenbauer and Köhler and found to

result by a traumatism of the skin and to be characterized by the formation of a pocket between the skin and the underlying fascia into which there is an escape of lymph with a certain amount of blood. The contents of this pocket are usually yellowish but may have a red tinge, and never coagulate after evacuation. Experiments have been made on a rabbit's ear when the othematoma was produced by rubbing the ear between the fingers which confirmed the author's views.

ZARNIKO.

31. VOERNER. *On lymphangiectomy of the auricle.*

The tumor contained fluid which resembled lymph. The walls were lined with endothelium. It was therefore regarded as a lymphangiectomy of the auricle.

SCHEIBE.

32. DELSTANCHE. *Mastoiditis and furunculosis.*

Description of two cases in which the diagnosis wavered between mastoiditis and furunculosis. In these cases Wilde's incision was recommended.

BRANDT.

33. WILLAUME-JANTZEN. *Communication from the aural clinic of the military hospital in Copenhagen.*

A plasterer sought aid on account of deafness. A few days later he returned with a very much ruptured drum with the statement that he had introduced a match into his ear, as he believed that was the way they treated the ear in the clinic. He claims to have had no pain. Uninterrupted recovery.

JOERGEN MOELLER.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

34. BAAR. Contribution to the etiology of acute suppurative otitis media after measles. *Wiener med. Wochenschr.*, No. 6, 1906.

35. RIMINI. Paralysis of the abducent nerve of aural origin. *Arch. internat. d'otolog.*, etc., vol. xxi., p. 125.

36. WOLKOWITSCH. On the method of trephining the mastoid process. *A. f. O.*, vol. lxvi., p. 180.

37. STENGER. Bier's congestion method in acute suppurative otitis. A new method of operating in cases of acute mastoiditis. *Deutsche med. Wochenschr.*, No. 6, 1906.

38. HEYNINX. Suppression of intra-aural dressings after the radical operation. *Arch. internat. d'otol.*, etc., vol. xxi., p. 185.

39. OSTMANN. On the diagnosis and prophylaxis of inflammation

of the labyrinth in acute otitis. *Münchener med. Wochenschr.*, 1906, No. 15.

40. DATES. The treatment of perforations of the tympanic membrane with especial reference to the use of gutta-percha tissue. *Medical Record*, November 11, 1905.

41. BALLIN. Ossiculectomy under local anæsthesia in the treatment of chronic suppurative otitis media. *N. Y. Med. Journ.*, February 17, 1906.

42. BRAESLIN. Two cases of injury of the ear by lightning. *Brooklyn Med. Journ.*, April, 1906.

43. ROBINSON. Bacteriological findings in fifteen cases of epidemic cerebro-spinal meningitis, with special reference to the isolation of the meningococcus from the conjunctiva and from the circulating blood. *American Journ. Med. Sciences*, April, 1906.

44. REIK. The blood-clot dressing in mastoidectomy, considered physiologically. *Journ. American Med. Assoc'n*, March 31, 1906.

45. BRYANT. Technique of the radical tympano-mastoid operation when complicated by the forward position of the sigmoid sinus. *N. Y. Med. Journ.*, April 14, 1906.

46. SPRAGUE. Observations in two hundred cases of mastoid disease with operations. *Annals of Otol., Rhinol., and Laryngol.*, September, 1905.

34. BAAR. *Contribution to the etiology of acute suppurative otitis media after measles.*

In five children of one family after the disappearance of the eruption at the end of the second week suppuration started in one ear. In three of these five children the mastoid process had to be opened on account of threatening cerebral symptoms. In one case there was an extradural abscess. The bacteriological examination of Weichselbaum showed staphylococcus pyogenes in the pus from the ear and from the mastoid.

WANNER.

35. RIMINI. *Paralysis of the abducent nerve of aural origin.*

In reporting three cases of paralysis of the abducent nerve in purulent otitis media (in one of these bilateral paralysis) Rimini discusses the pathogenesis of this interesting complication of purulent ear disease. Of importance in etiology is a circumscribed meningitis, an epidural abscess, caries at the tip of the petrous pyramid or neuritis of the nerve.

OPPIKOFER.

36. WOLKOWITSCH. *On the method of trephining the mastoid process.*

The author attempts, like many others, to shorten the period of recovery after mastoid operations by removing, even in acute cases, the posterior bony canal wall. In addition to this the membranous canal is split in the posterior wall and by suitable gauze pads the edges of the flaps are forced into the mastoid. His results in acute cases are as follows: complete closure of the wound behind the ear in $4\frac{1}{2}$ weeks (average out of 31 cases); canal dry after $4\frac{3}{4}$ weeks (22 cases). His results in the chronic cases show an average recovery in between three and nine weeks. HAENEL.

37. STENGER. *Bier's congestion method in acute suppurative otitis. A new method of operating in cases of acute mastoiditis.*

Contrary to the opinion of other authors, Stenger considers Bier's practice in acute aural suppurations to be a procedure of considerable importance. The presence of adenoid vegetations is considered a fair indication. If aural suppuration is complicated with mastoiditis a small incision is made through the soft parts, the periosteum is retracted, and a narrow canal is made into the mastoid antrum, or a fistulous tract is enlarged. A piece of gauze is introduced and a Bier's dry cup placed thereon, which remains in position for about three hours. This same procedure is repeated on the following days, the duration of the aspirating action is gradually diminished. This method has given the author rapid recoveries and he heartily recommends it. Moreover in two cases of mastoid operations which did not heal promptly the congestion method gave excellent results. NOLTENIUS.

38. HEYNINX. *Suppression of intra-aural dressings after the radical operation.*

Based on a single case, the author recommends in operation for acute mastoiditis not to pack the wound with gauze but to immediately close the skin with Michel's hooks. Drainage takes place through the auditory canal, which contains a gauze tampon for four days. OPPIKOFEK.

39. OSTMANN. *On the diagnosis and prophylaxis of inflammation of the labyrinth in acute otitis.*

A timely diagnosis of threatening perforation into the labyrinth can only be made by the exact examination of the aural function from the beginning. If a rapid loss of perception for the highest tones down to the sixth octave occurs, the danger is threatening. The reviewer is inclined to regard this as of value only when hearing for speech is also poor. Moreover the reviewer observes that the hearing for speech has not been regarded, especially the test of Lucae and Dennert. Ostmann recommends the determination of the upper tone limit, Weber's test, and the examination of bone conduction. The very important lower tone limit is also forgotten.

SCHIEBE.

40. YATES. *The treatment of perforations of the tympanic membrane, with special reference to the use of gutta-percha tissue.*

Yates uses in fresh ruptures of the tympanic membrane in absence of suppuration a patch of gutta-percha tissue cut large enough to cover the perforation and afford firm attachment to the surrounding healthy membrane. When in subsiding acute otitis media the opening is slow in closing, Yates irritates the edges of the perforation with a solution of 8 to 12 per cent. of nitrate of silver and then attaches the rubber disk. In old perforations the edges are either pared off with a knife or cauterized to induce a new growth.

M. TOEPLITZ.

41. BALLIN. *Ossicectomy under local anæsthesia in the treatment of chronic suppurative otitis media.*

By using the injection method of Neumann producing local anæsthesia, the operation of ossicectomy is considered sufficiently revolutionized to be recommended as a preliminary surgical procedure in all cases of chronic suppurative middle-ear disease in which local treatment of every kind has proved unavailing. The anæsthetic used is a 1 per cent. solution of cocaine to which is added an equal part of adrenalin solution 1:1000. Of this solution, 20-30 minims are injected into the superior wall of the external meatus at the place of union of the membranous and bony canal. The instruments used and the method of operating are described in detail.

CLEMENS.

42. BRAESLIN. *Two cases of injury of the ear by lightning.*

Case I., male aged twenty-seven, was struck while coming from the surf and was unconscious for three hours. The hair was burned from left side of occiput. Complained of fulness, roaring tinnitus, and impairment of hearing. Examination showed a perfectly round perforation in the left membrana tympani about one-eighth inch in diameter, slightly anterior to and below the centre, the remainder of the drum being pale.

Case II. showed a perforation in the left membrana tympani in the centre just behind the umbo, the subjective symptoms being similar to those in Case I. Both cases made a rapid and perfect recovery.

The author is of the opinion that a small charge of electricity doubtless followed the line of moisture through the external auditory canal and caused the perforations. The sound-perceiving apparatus was carefully examined and found to be uninjured.

CLEMENS.

43. ROBINSON. *Bacteriological findings in fifteen cases of epidemic cerebro-spinal meningitis, with special reference to the isolation of the meningococcus from the conjunctiva and from the circulating blood.*

In a study of fifteen cases the organism isolated from the spinal fluid, circulating blood, pus from the conjunctiva and from the central nervous system at autopsy, agrees in all respects with the diplococcus intracellularis meningitidis of Weichselbaum. It was isolated in pure culture from the spinal fluid of the fourteen cases in which lumbar puncture was performed and is to be considered the causal agent in all these cases. This organism was obtained from the circulating blood of two of the four investigated cases, but in one only did it grow on the various culture media. It is probably only an occasional invader of the circulating blood. It may be present in the blood for many days during the course of the disease and does not occur only shortly before death. Secondary lung infection with pyogenic organisms is frequent. Terminal broncho-pneumonia was found in five of the six cases that came to autopsy.

CLEMENS.

44. REIK. *The blood-clot dressing in mastoidectomy, considered physiologically.*

The primary object in the use of the blood-clot method is to obtain healing of the mastoid wound by first intention. Such a result will restore the normal contour of the part, reduce the period of healing to five or seven days, and render the prolonged and painful after-treatment of other methods unnecessary. The patient's blood flowing into the wound, when safeguarded from later infection, rapidly clots and forms a framework on which the new tissue is built. Even if the wound cavity is not surgically clean, it has been demonstrated that the blood possesses certain bactericidal power which is more active when drawn from the vessels than when still in the circulation. The difference is thought to be due to the leucocytes of the clot breaking down and discharging their entire complement of nuclein. The bactericidal action is transient and is only present when the blood is alkaline. The use of certain chemical antiseptics usually employed in cleansing the wound materially reduces this alkalinity, and some of the failures of this method, due to the disintegration of the blood-clot, are probably traceable to this cause. It is more rational to rely on dry cleaning of the wound, or to wash the cavity with sterile salt solution which, if it produces any effect on the coming clot, renders it more alkaline and thereby increases its power to control septic action. To avoid the formation of stitch abscesses, the subcutaneous silver-wire suture is advised. Care must be taken not to penetrate the skin at any point as the staphylococcus epidermidis albus is found in the deeper layers of the corium. Suggestions on the technique are added. Reik believes that this method will be accepted as the standard in mastoidectomy.

CLEMENS.

45. BRYANT. *Technique of the radical tympano-mastoid operation when complicated by the forward position of the sigmoid sinus.*

Several cases are here reported to demonstrate the author's method of avoiding injury to the sigmoid sinus when it approaches the external auditory canal. When the sinus has been uncovered in an extremely anterior position the posterior wall of the auditory meatus is removed, and the dura mater covering the front of the cerebellum is pressed back with a

flat retractor, to allow the operator to enter the antrum. The membranous meatus is slit posteriorly and longitudinally and is lightly packed with gauze to separate the edges. The postaural wound is allowed to close without sutures, and the remaining small cavity fills up with blood-clot. The middle-ear cavity is not packed, convalescence and epidermization being hastened thereby. The exposure of the dura mater does not contraindicate the use of the modified blood-clot.

CLEMENS.

46. SPRAGUE. *Observations in two hundred cases of mastoid disease with operations.*

One hundred and fifty-eight cases were acute and forty-two chronic. The causes of inflammation in the acute cases were: scarlet fever in six, measles in two, typhoid fever in one, and influenza in 149 cases. The principal subjective symptom was pain just after midnight; tenderness, profuse discharge, and the nipple-like protrusion of the upper posterior quadrant of the drum-head often indicate mastoid involvement, particularly sagging of the canal wall. The white count of the blood from 16,000 to 20,000 or above means pent-up pus somewhere; a polynuclear count of 80 per cent. or over gives evidence of septic infection. Lumbar puncture gave in two serous meningitis cases immediate relief to the brain-pressure symptoms. Thrombosis of the lateral sinus in eight cases, six recovered without ligation, one died of pyæmia with metastatic abscess, another of leptomeningitis. Sinus phlebitis in four cases due to streptococcus all recovered. Extradural abscess in four cases, one of which showed three independent abscesses, one over the root of the zygoma, one over the roof of the tympanum, and one over the roof of the mastoid; this case was also complicated by thrombosis of the sinus; all recovered. Serous meningitis complicated three cases; all of which died. Dementia, one with somnambulism, in two cases, sixty-five and seventy-nine years of age respectively. One case with dry necrosis had only slight deafness before, drum-head and canal normal, but the mastoid, up to the whole inner surface, was one mass of softened necrotic tissue intermingled with thick cheesy pus. One case of purulent meningitis was due

to trephine injury; in an attempt at opening the mastoid with trephine, a button of dura and brain tissue had been cut along with button of bone. One case had both mastoids involved; after operating on one mastoid, a large mass of adenoids and two enormous tonsils were removed, but in the other ear paracentesis of the drum-head resolved the unoperated mastoid without further trouble. Sprague uses the cigarette drainage after operation. Fifteen cases died, four of pyæmia, three of serous meningitis, three of brain abscess and meningitis, two of purulent meningitis, one of septicæmia, one of shock,—a child two months old,—and one of adenocarcinoma, eight months after operation,—all, except the baby, from complications well established before operation. One hundred and four out of one hundred and fifty-eight acute cases were healed in four weeks, twenty-five of these in two and seventy-six in three weeks; one was delayed by diabetes. Private cases heal much more quickly than the average hospital case. Of complications were: Septic arthritis in two cases (one streptococcus), streptococcus infection of the skin of the face and scalp resembling erysipelas in two cases; one died at the age of seventy-nine. The ages of the patients ranged from six weeks to seventy-nine years; every case, even the youngest showed mastoid cells external to the antrum.

M. TOEPLITZ.

b.—CHRONIC SUPPURATIVE OTITIS.

47. ISEMER. On primary tuberculous disease of the mastoid process in childhood. *A. f. O.*, vol. lxvii.

48. GERSUNY. An operation in motor paralysis. *Wiener klin. Wochenschrift*, No. 10, 1906.

49. RICHARDS. The non-operative treatment of chronic otitis media purulenta, with special reference to the use of pyoktanin. *The Laryngoscope*, Sept., 1905.

50. COTT. Peculiar symptoms following a radical operation. *Journ. Amer. Med. Assoc.*, Nov. 17, 1905.

47. ISEMER. On primary tuberculous disease of the mastoid process in childhood.

Of forty mastoid suppurations in children up to thirteen years, the author found tuberculosis present in four. The diagnosis was made from microscopic examination of sections and bacteriological examination of a smear and inoculations.

He comes to the following conclusions: 1. Mastoid tuberculosis occurs in early childhood more frequently than is generally assumed, and in fact 13 per cent. of all mastoid cases are tuberculous. 2. About half of these tuberculous mastoiditis are primary—in other words, originate by way of the blood current; the other half are secondary, usually an extension from a previously affected lymphatic tissue in the naso-pharynx. 3. The beginning of the disease is an insidious one, not painful. The findings in operations are not characteristic. 4. The most important proof for the tuberculous nature of the disease is furnished by the microscopic examination of diseased parts. Animal experimentation is also definite. 5. The chances of relief from operation are very favorable in the cases of primary tuberculous mastoiditis, different, however, in cases of an extension of the tuberculous disease, because the progression of the primary focus may threaten the life of the patient.

ZARNIKO.

48. GERSUNY. *An operation in motor paralysis.*

Gersuny reports a case of facial paralysis occurring after a mastoid operation. In order to relieve this condition the orbicular muscle of the mouth was dissected free both in the upper and the lower lip through the mucous membrane. After a division in the middle line the non-paralyzed half was united with the paralyzed half. The wound of the mucous membrane was united. After a comparatively brief interval the facial paralysis was completely cured.

WANNER.

49. RICHARDS. *The non-operative treatment of chronic otitis media purulenta, with special reference to the use of pyoktanin.*

In a large number of cases of chronic otitis purulenta, where operative interference is not imperatively demanded, milder measures lead to cures, particularly pyoktanin 4.0 with boric acid 36.0 used as powder or in watery solution of varied strength. Of the thirty-six tabulated cases thus treated six were not improved at all, fourteen were improved, sixteen were cured. Three of the cured cases had a temporary relapse, but with final cessation of the discharge.

M. TOEPLITZ.

50. COTT. *Peculiar symptoms following a radical operation.*

A female physician who had been suffering from a fetid discharge and caries of the left middle ear and a myocarditis was radically operated upon; the mastoid cells and cavity were filled with granulations and débris, but without pus. The temperature rose up to the eighth day to 101.6°, fell again, but jumped on the twelfth day to 104.4°, reached on the seventeenth 105°, fell to 99°, rose to 104°, and reached on the twenty-sixth day with frequent rises and remissions the normal line. Opening of the sinus was contemplated, but not done. The pulse had varied from 56 to 110.

M. TOEPLITZ.

C.—CEREBRAL COMPLICATIONS.

51. NEUMANN. The differential diagnosis of cerebellar abscesses and labyrinthine suppurations. *A. f. O.*, vol. lxvii.

52. HEIMANN. A case of acute abscess of the temporal lobe. *A. f. O.*, vols. lxvi., lxvii.

53. UFFENORDE. A case of cerebellar abscess with almost complete amaurosis after acute purulent otitis, with recovery. *A. f. O.*, vol. lxvi.

54. PONTOPPIDAN. A case of one-sided sinus thrombosis with epidural and subdural abscesses. *Hospitalstidende*, 1906, p. 285.

55. STENGER. A report of cases of serous meningo-encephalitis of otitic origin. *A. f. O.*, vol. lxvii., p. 144.

56. GERBER. Encephalitis and acute otitis of influenzal origin. *A. f. O.*, vol. xlvi., p. 31.

57. ZERONI. Operative meningitis. *A. f. O.*, vol. lxvi., p. 199.

58. HANSBERG. Sinus thrombosis and articular rheumatism. A contribution to the connection between the ear and general diseases. *Zeitschrift für ärztliche Fortbildung*, No. 4, 1906.

59. GRADENIGO. A characteristic symptom of purulent thrombosis of the superior longitudinal sinus. *A. f. O.*, vol. lxvi., p. 243.

60. IWANOFF. The opening of the bulb of the jugular vein in otitic pyæmia. *Chirurgija*, July, 1905.

61. IWANOFF. The technique and report of cases of operation on the jugular bulb. *A. f. O.*, vol. lxvii.

62. IGLAUER. A case of mastoiditis complicated with extradural abscess, without history of a discharge from the auditory canal. *Annals Otolog., Rhinolog., and Laryngolog.*, March, 1906.

63. BARSTOW. A case of tympanic and mastoid cholesteatoma; extradural abscess; sinus thrombosis; prolonged pyæmic temperature without metastases; recovery. *Medical Record*, February 10, 1906.

64. STARR. Intracranial lesions as sequelæ of chronic purulent otitis media. *Medical Record*, March 10, 1906.

65. OPPENHEIMER. Mastoiditis and sigmoid sinus thrombosis in an infant. *New York Medical Journal*, March 31, 1906.
66. BRYANT. Operative technique and after-treatment for mastoiditis with epidural complications. *Medical Record*, March 31, 1906.
67. HASTINGS. Sinus thrombosis. Two cases with masked symptoms. *Journ. Amer. Med. Assoc.*, Nov. 18, 1905.
68. BARNHILL. The diagnosis of intracranial complications of suppurative ear disease. *Journ. Amer. Med. Assoc.*, Nov. 11, 1905.
69. RICHARDS. A case of infective sigmoid sinus thrombosis and jugular vein infection of otitic origin without apparent mastoid involvement in an adult; operation; recovery. *N. Y. and Phil. Med. Journ.*, December 16, 1905.

51. NEUMANN. *The differential diagnosis of cerebellar abscesses and labyrinthine suppurations.*

Disturbances of equilibrium, vertigo, nausea, vomiting, headache, optic neuritis, variations in temperature, do not aid in the differential diagnosis between cerebellar abscesses and labyrinthine suppurations, because they occur in either disease. Nystagmus is, however, a symptom of more importance. Nystagmus caused by disease of the labyrinth is characterized by the following feature, namely, that the symptom becomes weaker and gradually disappears in progressive destruction of the labyrinth. The nystagmus originating in the cerebellum increases with the progress of the affection and finally attains such a degree as is never seen in diseases of the labyrinth. Moreover, if at the beginning nystagmus is present only when the eyes are turned to the healthy side and then suddenly changes to a nystagmus when the eyes are turned to the affected side, a cerebellar abscess may be diagnosed with certainty and a labyrinthine origin may be excluded.

If it is necessary at the operation to open the labyrinth, the labyrinthine nystagmus diminishes in intensity, while the cerebellar nystagmus is uninfluenced.

Certain points in the operation of cerebellar abscesses and the after-treatment are then given (the introduction of iodoform gauze strands which are soaked in hydrogen peroxide in order to destroy anaërobic bacteria). Five case histories are given.

ZARNIKO.

52. HEIMANN. *A case of acute abscess of the temporal lobe.*

Injuries of the ear have increased since the Russo-Japanese war among the patients of the author. A single case history (cauterization of the ear, destruction of the drum, consecutive mastoid otitis with necrosis, abscess of the temporal lobe; operation; recovery) leads the author to publish extensive statistics on otitic brain abscess.

These include 819 cases, of which 645 had been studied by the author in the original or in extensive reports and 174 were not accessible. Both categories are grouped in tables. The author endeavors to solve the following questions: 1. The proportion of the otitic cerebral abscess to the cerebellar abscess; the frequency of abscesses in the various situations in the cerebrum. Answer: Abscesses of the cerebrum are twice to three times as frequent as cerebellar abscesses. Frontal lobe abscesses are least frequent; those in the occipital lobe come next and those situated in the temporal lobe are the most frequent. 2. Relations of otitic cerebral and cerebellar abscesses to the various periods of life. Answer: Otitic brain abscess is least frequent after the sixtieth year, than in the first five years of life; it is most frequent in the second and third decades. 3. Relations of otitic cerebral and cerebellar abscesses to sex. Answer: They occur in men three times as frequently as in women. 4. Contrary to generally accepted opinion, the author finds the left side more frequently affected than the right. 5. As regards multiplicity of abscesses, 45 cases (that is seven per cent.) had two abscesses, one case had three, and two presented multiple abscesses. 6. The most frequently fatal complication of brain abscess is meningitis, in the second line sinus thrombosis. 7. The results of recovery are better in abscesses produced by an acute suppuration than in those following chronic suppurations. They are more favorable, moreover, in abscesses of the cerebrum than in cerebellar abscesses.

ZARNIKO.

53. UFFENORDE. *A case of cerebellar abscess with almost complete amaurosis after acute purulent otitis, with recovery.*

The patient came for treatment on account of hypertrophic rhinitis and consecutive tubal catarrh. Turbinotomy was performed on the right side. Fourteen days later acute

otitis set in on the left side, requiring the mastoid operation. A few days later a radical operation was performed. Shortly after that an infected thrombus was evacuated from the sigmoid sinus after ligating the jugular vein. No fever for fourteen days. Suddenly decided diminution of vision. Choked disk. Hemorrhage in the macula, star-shaped figure as in albuminuric retinitis. Two days later the surface of the cerebrum adjoining the sigmoid and transverse sinuses was exposed. Puncture. A purulent infected area of softening was exposed and drained. Gradual recovery, though motor disturbances were present for a time (convulsions of an apoplectic character). Vision, left, $\frac{8}{10}$; right, $\frac{7}{10}$.

ZARNIKO.

54. PONTOPPIDAN. *A case of one-sided sinus thrombosis with epidural and subdural abscesses.*

A woman forty-two years of age suffered from headache and vertigo after acute purulent otitis. There was tenderness to pressure along the anterior margin of the mastoid process and beginning choked disk. The mastoid was opened and as the symptoms continued an epidural abscess was evacuated and a thrombosed sinus resected after ligation of the jugular vein. The temperature continued high. In the sigmoid fossa another epidural abscess was discovered. Then rigidity of neck, stupor, and diplopia set in. A discolored area in the internal-sinus wall led to a subdural collection of pus. Convalescence was clouded by a slight psychosis. Finally complete recovery.

JOERGEN MOELLER.

55. STENGER. *A report of cases of serous meningoencephalitis of otitic origin.*

The author is of the belief that lumbar puncture does not furnish us any clue as to the kind or extent of an intracranial process (even if bacteria are found present they are of no diagnostic importance), and that the question of operation is determined by the general picture of the disease with the aid of all the symptoms and diagnostic methods. Three cases of severe cerebral complications are reported which followed chronic suppurations and were operated on without the aid of lumbar puncture. In the first there was a

combination of sinus phlebitis with meningitis and abscess in the posterior cranial fossa. In the second there was a brain abscess in the middle cranial fossa; and in the third an extensive meningitis originated in the labyrinth. In all three cases excellent results following a broad incision in the dura, by which in each case a very large quantity of cerebro-spinal fluid was evacuated, proved that the meningeal symptoms were produced by a serous meningo-encephalitis. The details of these interesting cases must be read in the original. The second case corresponded exactly to the symptom-complex of the acute œdema of the pia as described by Fürstner.

HAENEL.

56. GERBER. *Encephalitis and acute otitis of influenzal origin.*

The report of an unusual case of acute otitis of influenzal origin with associated multiple nerve paralysis (5th, 7th, 8th, 9th, 10th, 11th, and 12th nerves) from encephalitis.

HAENEL.

57. ZERONI. *Operative meningitis.*

Post-operative meningitis in chronic suppurative otitis is usually produced by a latent labyrinth suppuration. The author has collected twenty-nine of these cases, of which three are his own. The meningeal symptoms in three cases appeared at the time of operation, in eight on the day after operation, and in seven on the second day after operation. In fifteen of the twenty-nine cases before operation there was no sign that the condition was aggravated. In fourteen cases, however, there was an exacerbation characterized by the presence of attacks of headache and vertigo. Pathological examinations of the labyrinth revealed the greatest variety of kinds and stages of disease. The path of infection is usually along the internal auditory meatus; less frequently the aqueduct or diseased parts of the labyrinth capsule. Indirect extension of the labyrinth inflammation is caused by the usually present abnormal communications of the labyrinth with the middle ear, particularly through defects in the labyrinth windows. When these communications are absent, abnormal vascular communications between the tympanum

and the labyrinth cavity are assumed to be present. An unfavorable result on operation may lie in the concussion from the chisel or from the gauze packing. Post-operative meningitis may result without labyrinth disease. Of these cases Zeroni has collected eleven. At autopsy the origin of the meningeal affection which could not be diagnosticated in life, was found in a deep-seated focus, not discovered at operation, which alone would have been sufficient to induce meningitis. Paths of infection are formed by pre-formed openings in the dura, such as the sites of the nerves of the carotid and of the lymph vessels. In order to avoid post-operative infection of the meninges a very energetic search should be made in deep-seated extra-labyrinthine affections, while in diseases of the labyrinth the operation should be performed with great caution. The labyrinth should only be opened on threatening symptoms or in the presence of escaping pus from a labyrinthine fistula. The tympanic cavity should be treated with great respect, both in the use of gauze mops and in the use of the chisel. The occurrence of post-operative meningitis should serve as a warning not to delay operation and as a caution in the prognosis in all chronic suppurations where there is a suspicion of labyrinth complications.

HAENEL.

58. HANSBERG. *Sinus thrombosis and articular rheumatism. A contribution to the connection between the ear and general diseases.*

Hansberg reports three cases of sinus thrombosis which presented the picture of acute articular rheumatism. In the first two cases the patient came too late under the treatment of the aural surgeon, and extensive operations were of no avail. The third patient was saved.

As the symptoms of the articular rheumatism may mask the aural disease, it is possible in these cases to overlook entirely the sinus disease.

Hansberg believes that the pyogenic organisms originating from the sinus thrombosis possessed lessened virulence and thus were not capable of producing general pyæmia.

HOELSCHER.

59. GRADENIGO. *A characteristic symptom of purulent thrombosis of the superior longitudinal sinus.*

The presence of a fluctuating swelling in the vertex in the middle line at the posterior part of the sagittal suture must be regarded as a characteristic symptom of thrombosis of the superior longitudinal sinus. This swelling (dilatation of veins, hematoma, or abscess) may be associated with a dilatation of the veins, œdema of the hairy scalp of the forehead and of the lids. Eleven cases, in addition to the one personally observed, are cited in which the swelling was very tender and contained pus.

HAENEL.

60. IWANOFF. *The opening of the bulb of the jugular vein.*

Of the seven cases operated on by the author, three recovered. Of these the bulb was exposed in only two, but not opened. All the cases were very severe. In all cases of otitic pyæmia with disintegrating thrombosis Iwanoff recommends exposure of the bulb and, in extreme cases, its opening.

SACHER.

61. IWANOFF. *The technique and report of cases of operation on the jugular bulb.*

The author employs a method to expose the bulb of the jugular vein which corresponds exactly to that described by Voss. Resecting the apex of the mastoid is really of secondary importance. A case history is given in which the author evacuated a perisinuous abscess after the method of Grunert, which had extended into the region of the bulb. The sinus itself was not involved in the interior. There were no thrombosis and no pyæmic symptoms.

ZARNIKO.

62. IGLAUER. *A case of mastoiditis complicated with extradural abscess, without history of a discharge from the auditory canal.*

Patient, male aged thirty-seven, had an acute middle-ear suppuration for seven weeks without any evidence of a perforation of the drum, which was followed by acute mastoiditis. A mastoidectomy revealed an extradural abscess in and around the knee of the sinus, from which about a dram of pus was evacuated. The only symptoms present in the

case that might have suggested this complication were severe radiating pain, slowness of cerebation, and nervousness. The recovery was perfect. CLEMENS.

63. BARSTOW. *A case of tympanic and mastoid cholesteatoma; extradural abscess; sinus thrombosis; prolonged pyæmic temperature without metastases; recovery.*

A boy aged twelve had aural discharge and recurrent attacks of pain in the left ear and mastoid, following scarlet fever. The mastoid was opened and thoroughly cleaned out, but the following day a severe chill occurred with a rise of temperature to 104.6° F. The sigmoid sinus was then inspected and a soft gray clot was found extending from the knee to the bulb. Improvement after this operation followed for five days only, then the chills and pyrexia again occurred. The jugular vein was ligated and removed and later the torcular end of the sinus was re-examined and found clear. Thereafter, the case rapidly improved and made a good recovery. The patient was in the hospital eight weeks and four days; pyæmic temperature seven weeks and five days; no metastatic abscesses; thirty-nine chills; highest temperature in axilla 107.8° F., lowest in mouth 96° F., temperature range being 11.8° F. CLEMENS.

64. STARR. *Intracranial lesions as sequelæ of chronic purulent otitis media.*

This paper considers (1) the possible cerebral complications of otitis media, (2) the symptoms which aid in their diagnosis, (3) the proper methods of surgical treatment, and (4) the results of surgical operations for these complications. (1) Cerebral complications are abscess of the brain, meningitis, sinus thrombosis, and to which is now added acute encephalitis. (2) In differentiating between the presence of an abscess and the possibility of meningitis, much emphasis is laid on the examination of the cerebro-spinal fluid obtained by lumbar puncture, and to the examination of the blood. In meningitis the number of leucocytes is enormously increased, while in abscess there is no increase unless a complicating meningitis is present. The blood examination is equally valuable, showing a rapid leucocytosis if meningitis or brain

abscess develops in the course of otitis. Another important point is the rapid rise in the ratio of the polymorphonuclear leucocytes to other elements in the blood, and if the ratio changes from 65 per cent. up to 85 per cent. the probability of a cerebral complication is very great. (3) It is imperative to open the abscess as soon as the diagnosis is made and have the opening large enough for evacuation and drainage. (4) The author found in the literature from 1900 to 1906, out of eighty-one abscesses of the brain secondary to otitis on which operation was performed, forty-two patients recovered.

CLEMENS.

65. OPPENHEIMER. *Mastoiditis and sigmoid sinus thrombosis in an infant.*

The usual symptoms on which a diagnosis of sinus thrombosis following otitis media suppurativa is based, develop so late in an infant or are individually of such little importance, Oppenheimer finds in a study of this case, that the most reliable symptom of this complication is the exaggerated temperature range. He is of the opinion that the temperature should be taken every two or three hours, both day and night.

CLEMENS.

66. BRYANT. *Operative technique and after-treatment for mastoiditis with epidural complications.*

The report of several cases is made to illustrate: (1) the use of the author's front-bent gouge in preference to a mallet-driven instrument, (2) the use of the modified blood-clot, (3) the question of packing the mastoid wound after exposure of the dura mater. The first case: the wound was closed without sutures, the convalescence was very short, and the deformity was reduced to a nearly imperceptible scar. The second case: the wound was packed and left open, and although there was no infection the convalescence was more prolonged and the scar larger.

CLEMENS.

67. HASTINGS, H. *Sinus thrombosis. Two cases with masked symptoms.*

The thrombosis in each case, although of otitic origin, was masked in the first case by coexisting typhoid and in the second by a history of malaria. Chills, fever, and sweats

were not present in either case. The thrombosis in each case was suspected by irregularities in the history, which led to an uncovering of the sinus.

M. TOEPLITZ.

68. BARNHILL, J. F. *The diagnosis of intracranial complications of suppurative ear disease.*

Barnhill saw three acute cases, in all of which the ear disease from the beginning was severe, the pain excessive, and the patient unusually prostrated within a short time, no symptom pointing to brain extension, but without a sign of improvement. In one, the excessive pain led to opening the mastoid, which was neither painful, tender, nor swollen, but was found filled with pus, the pain continuing unabated. Two days later, paralysis of the arm of the opposite side, vomiting, unequal pupils, subnormal temperature and unconsciousness developed. The two other cases were less severe as to pain, mastoiditis was present in each by the tenth day, and symptoms of brain irritation and pressure followed rapidly. Moderate temperature followed by subnormal; accelerated pulse, later very slow; headaches far forward, vomiting, and exaggerated reflexes were seen in all. Only one case showed irregularity of pupil and paralysis of muscles.

M. TOEPLITZ.

69. RICHARDS, J. D. *A case of infective sigmoid sinus thrombosis and jugular vein infection of otitic origin without apparent mastoid involvement in an adult; operation; recovery.*

A male negro, aged nineteen, had an attack of acute suppurative otitis media of the left ear as the sequence of the grippe. Slight sero-purulent discharge ceased on the fourth day; on morning of fifth day complete left facial paralysis, continued until fourteenth day, when found by Richards to be peripheral. No mastoid symptoms, membrana tympani not reddened. Several days previous, complains of constant occipital headaches. Incision of drum, tympanic cavity dry. On fifteenth day, severe chill in hospital, temperature rose to 103.2° and suddenly remitted, followed by profuse sweat. Pulse fell from 88 to 62 during fever. Mastoid bone sclerotic, sinus superficial and exceedingly far forward, knee in contact with posterior canal wall. Antrum contained a few firm red

shot-like granulations. The middle of the vertical sinus limb descended through a patch of purulent dura 0.75 inch in diameter, representing a patch of purulent pachymeningitis not cemented to overlying bone. Vessel resilient, pulsating. It was opened and found obstructed by recent thrombus, invaded by streptococci, not broken down. Spontaneous free-return flows from either end occurred; the diseased external vessel wall was exsected. Four days after the operation, chill, temperature 104° F. Internal jugular vein now ligated low down and with portions of branches resected. Vein appeared normal, but walls of upper portion contained large numbers of streptococci. Wick gauze introduced into proximal end of sinus, carried well down into bulb, was soiled with pus when removed at first dressing. The facial paralysis disappeared by the fifth week. Recovery.

M. TOEPLITZ.

d.—OTHER DISEASES OF THE MIDDLE EAR.

70. JOERGEN MOELLER. On the pathology and diagnosis of otosclerosis. *Nord. med. Arkiv.*, 1905, vol. i., book 2.
71. SUGAR. On the treatment of otosclerosis with phosphorus. *A. f. O.*, vol. lxvi., p. 36.
72. BECK. Tumors of the middle ear with report of two rare varieties. *The Laryngoscope*, Oct., 1905.
73. BLAKE. Vertigo of aural causation. *Boston Med. and Surg. Journ.*, Oct. 5, 1905.
74. BRYANT. Capital operations for the cure of tinnitus aurium. *Journ. Amer. Med. Assoc.*, Dec. 9, 1905.
75. LECOMPTE. The Ménière symptom complex. *Boston Med. and Surg. Journ.*, Oct. 5, 1905.
76. BRYANT. The relation of ear disease to auditory hallucination of the insane. *Annals of Otol., Rhinol., and Laryngol.*, Sept., 1905.
77. OPPENHEIMER. Mastoiditis in infants. *Med. Rec.*, March 10, 1906.
78. OPPENHEIMER. Report of a case of traumatic mastoiditis. *Laryngoscope*, Feb., 1906.
79. WEBSTER. Keloid tumors. *Annals Otol., Rhinol., and Laryngol.*, March, 1906.
80. BECK. Angio-epithelioma of the middle ear. *Illinois Med. Journ.*, Feb., 1906.
81. SPENCER. A case of aneurysm of the middle ear with intact drum-head. *New York Med. Journ.*, March 17, 1906.
82. BERNSTEIN. A case of mastoiditis acutissima. *Detroit Med. Journ.*, Feb., 1906.

83. PFINGST. The course of the facial nerve through the petrous bone and the significance of its injury. *Louisville Monthly Journ. of Med. and Surgery*, March, 1906.

70. JOERGEN MOELLER. *On the pathology and diagnosis of otosclerosis.*

Moeller's views on the functional examination of otosclerosis are those which are usually accepted. Otosclerosis is a disease which invades the middle ear as well as the labyrinth and the corresponding functional results must be present. Instead of finding the triad of symptoms of Bezold characteristic for middle-ear diseases, the following conditions are present: bone conduction abbreviated, Rinne frequently positive though shortened, Gellé negative, lower tone limit slightly diminished, upper tone limit in almost all cases distinctly diminished. This last symptom is of great diagnostic importance. The unsuccessful treatment is mentioned in conclusion. The author has had the best results with vibrations of the drum membrane. MOELLER.

71. SUGAR. *On the treatment of otosclerosis with phosphorus.*

The author concludes as follows:

1. Treatment with phosphorus for spongification in otosclerosis does not seem to be sufficiently well established on a scientific basis.

2. If its success is acknowledged, the way in which the phosphorus is prescribed is not indifferent.

3. The administration of mineral phosphorus for years in doses exceeding the maximal is not without question.

4. The prescribing of the harmless organic phosphorus is of advantage in all cases. HAENEL.

72. BECK. *Tumors of the middle ear with report of two rare varieties.*

After enumerating all the different tumors ever found in the middle ear, Beck reports a case of an angio-endothelioma of the middle ear, attached to its anterior wall, in a woman aged twenty-three years, removed by radical operation. The second case was a true myxoma of the middle ear. A complete bibliography is appended to the paper. M. TOEPLITZ.

73. BLAKE, C. *Vertigo of aural causation.*

Blake states briefly (1) that vertigo of aural causation is

primarily a pressure symptom; (2) that pressure may be exerted upon the labyrinth from without, the middle ear; (3) from within, by invasion of the intracapsular space, as in hemorrhage into the labyrinth; (4) that the effect in intensity and duration upon the semicircular canals of the intralabyrinthine pressure will depend upon the locality and extent of hemorrhage; (5) that recurrent vertigos are the result of an excessive intralabyrinthine vessel-dilatation from suspense of vasomotor inhibition of reflex origin, either alone or with intralabyrinthine persistent pressure of extrinsic or intrinsic origin.

M. TOEPLITZ.

74. BRYANT, W. S. *Capital operations for the cure of tinnitus aurium.*

The indications for operation in grave tinnitus are akin to those found in trifacial neuralgia. Intradural section of the nerve should be done. Suppuration should be stopped before. The source of the tinnitus must be located in or about the labyrinth. A central cause for tinnitus could remain unchanged after operation. After sixty-five auditory neurectomies on the cadaver the technic of the operation is described. From a discussion of the reported cases, of which those of Krause, Wallace, and Parry are given in full, Bryant concludes that, in carefully selected cases of tinnitus with the stimulus located in the peripheral end of the auditory nerve, the section of the eighth nerve, when done with proper technic, gives a good prognosis; also for the cure of aural vertigo.

M. TOEPLITZ.

75. LECOMPTE, W. A. *The Ménière symptom-complex.*

Lecompte reports two cases of Ménière's symptom-complex, the first in a man forty-five years old, who had several severe attacks at intervals of weeks and months, the cause being a high-pressure manner of life. The hearing was not lowered. In the second case, a woman, the cochlea was involved in addition to the static labyrinth, since the deafness persisted in the left ear, after vertigo and subjective noise had disappeared. The cause was an exhaustive condition of a septic puerperium. Vasomotor disturbances in the blood-vessels of the labyrinth, possibly with slight hemorrhages from these vessels, form the lesions.

M. TOEPLITZ.

76. BRYANT, W. S. *The relation of ear disease to auditory hallucination of the insane.*

Auditory hallucinations are often dependent on ear disease. Among fifty-six insane, five were without hallucinations of hearing, four had normal ears, forty-one with hallucinations of hearing, forty-two with abnormal ears (mostly non-suppurative), twenty-seven with tinnitus aurium, ten doubtful cases. The predisposition to the production of hallucination is a psychopathic condition, requiring an exciting cause, usually tinnitus. In four cases the hallucinations ceased after correction of catarrhal conditions of the ears.

M. TOEPLITZ.

77. OPPENHEIMER. *Mastoiditis in infants.*

The history of a nine-months-old child is given to illustrate the absence of prominent symptoms when the antrum is filled with pus. The general symptoms of mastoiditis vary in almost every case and are of value only in occasionally directing suspicion to the affected ear. Often the sole evidences of the ear affection must be gained from a careful study of the child for several days. In conclusion it is suggested that the membrana tympani of all infants be carefully examined notwithstanding the nature of the affection present.

CLEMENS.

78. OPPENHEIMER. *Report of a case of traumatic mastoiditis.*

Case, male aged forty-four, was thrown to the ground and stunned by an explosion of dynamite, but he did not lose consciousness. A sharp pain followed in the left ear, with some hemorrhagic discharge therefrom. The local condition upon examination was found to be similar to the well-known picture following such traumatic influences. A faint tenderness was present over the mastoid region which was intensified on deep pressure. The aural discharge became purulent and profuse. About six weeks after the accident ossiculectomy was performed without benefit. A mastoidectomy performed some ten weeks later showed the antrum and adjacent cells and those of the tip, filled with offensive pus. The removal of carious bone exposed the dura over the sigmoid sinus and middle cerebral region. Directly above the aditus ad antrum

a distinct fissure three-quarters of an inch in length was observed. The case illustrates the futility of conservative treatment both surgical and medical, as applied to the intratympanic space in the attempt to avoid mastoid involvement; the absence of physical and local signs (other than the persistent suppuration) indicating the presence of an extensive disease of the mastoid process. CLEMENS.

79. WEBSTER. *Keloid tumors.*

Of twenty-one cases of keloid treated by the X-ray, five are here reported apparently cured, fourteen improved, one no marked improvement, and one grew worse. Since the development of the X-ray treatment, cases have been accumulating that show this to be the most effective form of treatment yet tried, excepting, perhaps, that of radium. CLEMENS.

80. BECK. *Angio-epithelioma of the middle ear.*

Case, female aged twenty-three, with no previous history of any aural disease, had at the age of nineteen slight deafness and some pain in the left ear which was associated with pulsating tinnitus. Three years subsequent to this an examination revealed a growth of a bluish-gray color which filled the entire auditory canal. An attempt to remove the growth with the aural snare under local anæsthesia was unsuccessful on account of the severe pain experienced and the profuse hemorrhage that followed a partial excision. A radical operation was made a month later when the entire tumor was removed. Recovery was rapid although facial paralysis took place three weeks after the operation and it still remains. The microscopical examination states the tumor to be a mass of connective tissue covered with stratified epithelium. The underlying tissue is composed largely of blood-vessels. In certain of these there is a partial or complete filling of the lumen with proliferated endothelial cells. The walls of vessels, except for the endothelium, show some inflammation, but otherwise negative. The endothelium forms plugs in some areas; in others there is a little or no hyperplasia. Diagnosis: angiomatous polyp, with endothelioma tendencies. CLEMENS.

81. SPENCER. *A case of aneurysm of the middle ear with intact drum-head.*

The case was a girl of twenty-two, who had been complaining of deafness of the right ear accompanied with a pulsation, regular and forcible, for some three months. No history of any serious illness or family taint. The pain was never very severe but the deafness became more and more pronounced. Examination showed that the membrana tympani was bulging considerably, which seemed to merge into the lower canal-wall. The color was dark red; no pulsation could be detected. Paracentesis was performed and following the incision a most alarming hemorrhage occurred, which was stopped with difficulty. Several hemorrhages took place thereafter before the incision closed completely. From the fact that at no time was there any bleeding into the middle ear, or any bleeding into the mouth or nose through the Eustachian tube, it was concluded that the swelling was an aneurysm of the tympanic branch of the middle meningeal artery.

CLEMENS.

82. BERNSTEIN. *A case of mastoiditis acutissima.*

Patient, male aged thirty-three, had general symptoms which were considered due to an attack of gripe, and in twenty-four hours there developed pain in the left ear, severe headache, slightly retracted head, irregular pulse and respiration, the breathing falling as low as nine per minute. There was mental hebetude, although he could be aroused with difficulty. There was no mastoid tenderness or swelling of the integument, but the left drum membrane was deeply inflamed and the upper part of the auditory canal showed slight bulging. There was no optic neuritis or involvement of the eye muscles. The left ear drum was opened, the incision being well carried out into the canal and only a slight quantity of serous fluid exuded, but the relief of all symptoms was instantaneous. As the right ear drum showed inflammatory changes this was opened as well. Improvement followed these operations for about twenty-four hours, then an unfavorable change took place and the patient died. It appears that meningitis developed but thirty-six hours before death, and the entire illness lasted but sixty hours.

CLEMENS.

83. PFINGST. *The course of the facial nerve through the petrous bone and the significance of its injury.*

During the radical mastoid operation, injury to the facial nerve takes place in the descending portion of the facial canal and beyond its exit from the stylo-mastoid foramen during the removal of the tip. Injury to the nerve is not always avoidable in extensive caries and variation in conformation of the bone, nor can it be detected by facial twitching during the operation. Symptoms of facial paralysis appear as soon as the patient is out of the anæsthesia, thereby differing from paralysis caused by neuritis or hemorrhage into the Fallopian canal. Regeneration of the nerve is complete, but when there is a division of the nerve, only partial restoration of function occurs.

CLEMENS

NERVOUS APPARATUS.

84. ALEXANDER and TANDLER. *Examinations of congenitally deaf dogs and cats and of the young of congenitally deaf cats.* *A. f. O.*, vol. lxvi., p. 161.

85. THANISCH. *A case of hysterical deafness.* *A. f. O.*, vol. lxvi., p. 116.

86. VON BEHM. *A case of late hereditary syphilis of both aural labyrinths.* *A. f. O.*, vol. lxvii.

84. ALEXANDER and TANDLER. *Examinations of congenitally deaf dogs and cats and of the young of congenitally deaf cats.*

In the two dogs the principal changes were found in the membranous cochlear canal and in the capsule of the cochlea; defects in the bony septum, degeneration of the papilla basilaris of the cochlea, obliteration of the membranous cochlear canal by complete apposition of the membranous walls. Cochlear nerve and spiral ganglion pathologically changed though very little diminished in size.

In the third dog the principal changes were found in the cochlear nerve and in the spiral ganglion. Bilateral degenerative atrophy of the cochlear nerve and of the saccular nerve, of the spiral ganglion, of the papilla basilaris of the cochlea, and of the macula sacculæ.

Congenital deafness in incomplete albinotic cats showed the following uniform pathological changes, consisting in

hypoplasia of the cochlear nerve and of the spiral ganglion, incomplete development of the stria vascularis. The secondary changes consisted in degeneration of the macula sacculæ and of the papilla basilaris, obliteration of the membranous pars inferior.

HAENEL.

85. THANISCH. *A case of hysterical deafness.*

Together with a simultaneous slight general hyperæsthesia and increased reflex irritability, there was an acute complete bilateral deafness which alternated with an over-sensitiveness of the auditory organ and the cessation of other hysterical symptoms.

HAENEL.

86. VON BEHM. *A case of late hereditary syphilis of both aural labyrinths.*

Notwithstanding the severity and the long course of the affection (the left ear had been affected one year, the right half a year), it was cured by the administration of mercury.

ZARNIKO.

NOSE AND NASO-PHARYNX.

a.—SEPTUM.

87. BOULAI. Two curious cases of correction of a spur of the nose. *Arch. internat. d'otol.*, etc., vol. xxi., p. 132.

88. BALLENGER. The submucous resection of the septum, illustrated. *Penna. Med. Jour.*, March, 1906.

89. WHITE. Resection of the nasal septum. *Boston Med. and Surg. Journ.*, Oct. 12, 1905.

90. HURD. A submucous resection operation for deviation of the nasal septum; with description of several new instruments. *Med. Rec.*, Nov. 25, 1905.

87. BOULAI. *Two curious cases of correction of a spur of the nose.*

The first case was that of a man who himself removed a spur of the septum with a file. The other case was that of a child where a marked deviation of the septum corrected itself in four years.

OPPIKOFEK.

88. BALLENGER. *The submucous resection of the septum, illustrated.*

The operation suggested by Ballenger has been performed by him on more than one hundred cases with fair results to his patients and it appears to be well adapted to fully 90 per cent. of all septal deformities requiring surgical correction. There is a complete description of all the instruments employed by him included in the paper. CLEMENS.

89. WHITE. *Resection of the nasal septum.*

White, after giving a full and elaborate history of the operation, concluded from his forty-five resections as follows: The anterior vertical incision extended backward should be chosen. The convex flap should be kept intact. In deflections lying far back a horizontal incision is added to the vertical one. Sutures are optional, but of advantage in extended incisions. Weak solutions of cocaine of 1 per cent. submucously injected are more satisfactory than the stronger. The operation is adapted to all types of deflections and spurs not in children under fourteen years of age. A complete bibliography is appended. M. TOEPLITZ.

90. HURD. *A submucous resection operation for deviation of the nasal septum; with description of several new instruments.*

Hurd uses a slightly curved incision differently placed according to the nature of the deflection, extending from the nasal floor upward and inward to the junction of the septum with the lateral wall. He uses for the incision a Myles septal knife; for elevating the periosteum, an elevator, double ended, one sharp end resembling a Volkmann curette, but filled with metal, the other end of copper, blunt and rounded, flexible; for perforating the cartilage the bone curette; for removing the cartilage, the swivel knife of Ballenger; for separating the two membranes after removal of cartilage, a speculum with a long upper blade and a short lower one; for removing the bony portion, the Gruenwald forceps; for removal of the septal ridge of bone freed from the floor when still attached behind, Hurd uses his own down-cutting forceps. M. TOEPLITZ.

b.—TUMORS.

91. CHAUVEAU. Tonsillar metastases in a case of sarcoma of the nasal fossæ. *Arch. internat. d'otol.*, etc., vol. xxi., p. 209.

92. FAITH. A case of rhinolith. *Laryngoscope*, March, 1906.

93. CAMPBELL. A case of primary syphilitic infection in the nose. *Journ. Amer. Med. Assoc.*, May 5, 1906.

94. DABNEY. Report of a case of adeno-sarcoma of the tonsillar ring. Resection of both external carotid arteries; recovery. *Laryngoscope*, May, 1906.

91. CHAUVEAU. Tonsillar metastases in a case of sarcoma of the nasal fossæ.

A woman sixty-nine years of age presented a sarcomatous tumor in the right middle meatus which was radically removed. Two months later a local recurrence took place. This was quickly followed by metastases in both tonsils. The patient died from cachexia one year after removal of the primary tumor.

OPPIKOFER.

92. FAITH. A case of rhinolith.

The patient, female, aged seventeen, complained of nasal obstruction, foul discharge, and constant pain in the right side of the head for the past six months. A large unyielding mass was found in the right side, occupying the posterior half of the inferior and middle meatus, which also projected into the post-nasal space. The stone was removed with forceps, was of a dirty-gray color, and had for its nucleus a pearl button five-eighths of an inch in diameter. The button had been inserted fifteen years prior to the examination. The gross weight of the stone was about 100 grains and, with the exception of a slight decrease in the size of the inferior turbinate posteriorly, there was no structural damage done.

CLEMENS.

93. CAMPBELL. A case of primary syphilitic infection in the nose.

A surgeon, who was in perfect health, circumcised a patient on whose prepuce was a large indurated chancre. Two months after the operation, he noticed a stuffiness of the right nostril, and severe headaches which extended from the brow across the vertex to the occiput. On examining the nose, a condition was found resembling fibrinous rhinitis, limited to the inferior turbinate, from which there was no ichorous discharge. Eighty days after the probable inoculation a macular rash appeared on the abdomen. There were papules at the base of the uvula, but no congestion or soreness of the

fauces. The glandular enlargement was limited to the sub-maxillary of the right side. After a few mercurial inunctions all evidences of the disease disappeared. CLEMENS.

94. DABNEY. *Report of a case of adeno-sarcoma of the tonsillar ring. Resection of both external carotid arteries; recovery.*

Patient, female mulatto, aged fifty-five, tubercular, suffered from distressing tinnitus in the left ear for about one year. Examination showed only a slight hyperæmia of the drum along the malleus and opposite the tympanic orifice of the Eustachian tube. In the fauces the positions of the left lingual tonsil and faucial tonsil were occupied by nodular growths, that of the lingual tonsil extending well down into the tissues overlying the epiglottis. The growths were of a glazed appearance and of a dirty grayish-pink color. The right tonsil was involved as well but not to the same extent. The naso-pharynx was almost completely occupied by a growth in the position of the Eustachian tube and nodular masses were intruding into the left tubal orifice. Microscopical examination of a section showed growth to be adeno-sarcoma. As a palliative measure resection of both external carotids was advised and performed at different times, and the tissues of the fauces soon after became blanched and the growths diminished in size, rendering deglutition and respiration easier and causing improvement in the tinnitus, hearing, and speech. The lymphatics in the region are still enlarged although not as sensitive as before the operation. Six months after, the case appears to be progressing most favorably. CLEMENS.

C.—ACCESSORY SINUSES.

95. VAN DEN WILDENBERG. *On the anatomy of the sinuses of the face. La presse oto-laryngologique Belge*, book 3, 1906.

96. BERENS. *Comparative results of conservative and radical methods in the treatment of sphenoidal sinusitis. Arch. internat. d'otol., etc., vol. xxi, p. 97.*

97. KOELLREUTHER. *The results of Delsault's operation in empyema of the antrum. München. med. Wochenschr., 1906, No. 9.*

98. VON BEHM. *An unusual injury of the maxillary antrum by a bullet. München. med. Wochenschr., 1906, No. 13.*

99. CAPART. Operative indications in the treatment of sinusitis. *La presse oto-laryngologique Belge*, 1906, book 2.
100. HAJEK. On the method of establishing the indications for the surgical opening of the frontal sinus. *Arch. internat. d'otol.*, etc., 1906, p. 1.
101. DELNEUVILLE. A case of ocular complication of sphenoidal sinusitis. *La presse oto-laryngologique Belge*, 1906, book 1.
102. HOFFMANN. Multiple abscesses of the brain following suppurations of the two frontal sinuses of traumatic origin. *Arch. internat. d'otol.*, etc., vol. XXI., p. 79.
103. JOHNSTON. Empyema of the frontal sinus. *Amer. Journ. Med. Science*, Nov., 1905.
104. STUCKY. Case of chronic suppurative ethmoiditis, sarcoma of the right temporo-sphenoidal lobe with misleading symptoms. *Journ. Am. Med. Assoc.*, Apr. 28, 1906.
105. AMBERG. A simple method of finding an easily accessible portion of the lateral sinus. *Journ. Amer. Med. Assoc.*, May 19, 1906.
106. WILSON. Empyema of frontal, ethmoidal, and sphenoidal cells, with abscess in the orbit, serous meningitis, optic neuritis, otitis media. Operation. Recovery. *Laryngoscope*, May, 1906.
107. WOODBURY. Brow ache: frontal sinus congestion with periodical headaches. *N. Y. Medical Journ.*, Apr. 21, 1906.
108. BERENS. The results of operation by way of the maxillary route for combined disease of the maxillary antrum, ethmoidal labyrinth, and sphenoidal sinus. *Ann. Otol., Rhinol., and Laryngol.*, Sept., 1905.
109. COFFIN. The external operation for the relief of ethmoiditis. *Annals of Otol., Rhinol., and Laryngol.*, Sept., 1905.
110. RICHARDS. Personal experiences with empyemata of the frontal sinus. *Amer. Journ. Med. Science*, Nov., 1905.
111. WELLS. The intranasal route in operating upon the nasal accessory sinuses. *Ann. Otol., Rhinol., and Laryngol.*, Sept., 1905.

95. VAN DEN WILDENBERG. *On the anatomy of sinuses of the face.*

1. Unusually large ethmoidal cells situated at the posterior surface of the frontal sinus.

2. Cartilaginous septum in the maxillary antrum which completely shuts off a part of this cavity.

There are two illustrations.

BRANDT.

96. BERENS. *Comparative results of conservative and radical methods in the treatment of sphenoidal sinusitis.*

The author concludes as follows:

Acute uncomplicated empyema of the sphenoidal sinus should be treated conservatively.

Acute multiple sinusitis, including the sphenoidal cavity, may under favorable conditions be treated with conservative means.

Isolated chronic empyema of the sphenoidal cavity can be treated conservatively if it is not accompanied with severe changes in the mucous membrane.

In the latter case and in associated empyema of the other cavities a radical operation is necessary. OPPIKOFER.

97. KOELLREUTHER. *The results of Delsault's operation in empyema of the antrum.*

Of sixty-six patients who were operated upon according to Delsault's method in the Rostock Ear Clinic, sixty-one were cured. This favorable result is especially to be ascribed to the careful after-treatment. The diseased mucous membrane was removed as thoroughly as possible. SCHEIBE.

98. VON BEHM. *An unusual injury of the maxillary antrum by a bullet.*

The bullet entered the canine fossa and partly penetrated the inferior meatus. The consecutive suppuration of the maxillary antrum was rapidly cured by operation. SCHEIBE.

99. CAPART. *Operative indications in the treatment of sinusitis.*

Capart puts the following three questions: 1. Are intracranial complications frequent in cases of sinusitis which are not operated upon? 2. Is it not possible that certain operations produce complications in the interior of the skull? 3. Can complications in the interior of the skull be prevented by operation?

1. After reviewing the literature, the author concludes that fatal complications of accessory-sinus diseases may occur but that they are extremely rare. We are not justified in inducing a patient to submit to an operation with the statement that caries threatens his life, nor may we assure him of the absolute lack of danger of his trouble.

2. The unfortunate result in a series of operations should make us cautious in cases where the complaints of the patients are in no relation to the danger of an operation.

3. This caution is still more in place because brain symptoms almost always prophesy death.

The results obtained by operation unquestionably will be important, but operation should be reserved for cases where a complication threatens or where the subjective symptoms of the patient demand it.

BRANDT.

100. HAJEK. *On the method of establishing the indications for the surgical opening of the frontal sinus.*

Some authors perform the radical operation on the frontal sinus too frequently and neglect endonasal treatment. By resecting the middle turbinal the radical operation of the frontal sinus can frequently be avoided. Hajek cites two cases of beginning orbital abscess where for some other reason a radical operation was deferred and after resection of the middle turbinal, much against expectation, there was an immediate improvement and complete recovery.

As the indications for radical operation are not the same for all operators, various authors show great differences in the number of their operative cases. Mermod has trephined one hundred and sixty-five frontal sinuses, while Hajek, notwithstanding an average material of 6000 patients a year, has only performed this operation twenty-three times during the last twelve years.

If cerebral complications are present, or are to be feared, the radical operation should be recommended if the headache and suppuration continue notwithstanding endonasal treatment. If, however, after endonasal treatment the headache disappears and there is no purulent discharge, it is necessary to individualize whether to suggest the radical operation or not.

OPPIKOFER.

101. DELNEUVILLE. *A case of ocular complication of sphenoidal sinusitis.*

Notwithstanding diminution of vision on both sides and central scotoma for colors, these symptoms disappeared after treating a purulent inflammation of the sphenoidal cavity. The author draws attention to the importance of examining the nose in these cases.

BRANDT.

102. HOFFMANN. *Multiple abscesses of the brain following suppurations of the two frontal sinuses of traumatic origin.*

A sailor twenty-one years of age was struck by a rudder on the forehead. Following this accident there was an empyema of both frontal sinuses. Two years later death from brain abscess. At the autopsy there was a meningitis at the base and convexity and four frontal abscesses. The one was situated on the right side and in direct communication with the right frontal sinus. The posterior wall of the frontal cavity was absent and there were granulations on the dura. The three abscesses on the left side developed by infection extending through the blood or lymph passages. The abscess pus contained streptococci. OPPIKOFER.

103. JOHNSTON. *Empyema of the frontal sinus.*

The case reported by Johnston illustrates the so-called closed empyema of the frontal sinus, in which at no time could a discharge of pus into the nose through the fronto-nasal canal be detected. The patient, aged thirty years, two weeks after a mild attack of grip had had severe pains over the left eye, occurring regularly every other day, beginning at 12 noon, or between 12 and 4 P.M., lasting from five to six hours, not when quiet, but after walking or excessive exercise. The periodicity of the attacks, the dryness of the nasal mucous membrane, and extreme tenderness on percussion led to the diagnosis of suppuration of the left frontal sinus. On opening the very thick anterior wall there was a gush of pus; the mucous membrane was degenerated and covered with granulations. No necrosis. Pus showed the staphylococcus pyogenes aureus in pure culture. M. TOEPLITZ.

104. STUCKY. *Case of chronic suppurative ethmoiditis, sarcoma of the right temporo-sphenoidal lobe, with misleading symptoms.*

Patient, male, aged fifty-one, occasionally had copious discharges from the nose for many years past. Recently there occurred severe pain in the frontal region, nausea, mental depression, and insomnia. Slight pressure or tapping over frontal sinus caused excruciating pain. Transillumination showed the right frontal and maxillary sinuses involved. During the course of the next three days, aphasia, slight convulsions of the right hand and arm, deviation of the tongue

to the right, more bulging of the right eye, and stupor developed. Upon opening the frontal sinus the lining membrane was found greatly thickened and the naso-frontal duct occluded by granulations. The maxillary sinus was found blocked by firm tissue which involved the nasal wall and the floor of the orbit. Autopsy showed the whole right temporo-sphenoidal lobe adherent over base, and on section it appeared to be replaced by an encapsulated, mottled, red and gray mass of semi-solid pasty consistence. Microscopical examination showed tumor to be sarcoma, both round and small spindle cells being found. The whole tumor was far advanced in process of degeneration with evidence of inflammatory infiltration and necrosis, the indication being that the infection had extended from the nasal accessory sinuses. CLEMENS.

105. AMBERG. *A simple method of finding an easily accessible portion of the lateral sinus.*

The lateral sinus can be found when we open that part of the mastoid process which is located in the direction of a line which equally divides the angle formed by the linea temporalis and the anterior border of the mastoid process (an angle of about 115°). CLEMENS.

106. WILSON. *Empyema of frontal, ethmoidal, and sphenoidal cells, with abscess in the orbit, serous meningitis, optic neuritis, otitis media. Operation. Recovery.*

Patient, male, aged thirty, had nasal catarrh for two years, and during the past two weeks has suffered much pain in the head and over the left frontal sinus. Examination of the left eye showed marked papillitis and blindness in nasal half of the field. There was a large perforation in the left ear drum from which pus was flowing. Operation by Killian's method revealed necrosis of the anterior and posterior ethmoidal cells. In the region of the posterior cells, the orbital wall was necrotic and a hole was found about the size of a dime from which pus escaped. Lumbar puncture was made and although the spinal fluid was clear, it spurted out as if it was under some pressure. On the ninth day, the drum had healed, and in a little over a month the patient had fully recovered, vision in the left eye being $\frac{3}{8}$. CLEMENS.

107. WOODBURY. *Brow ague: frontal sinus congestion with periodical headaches.*

Brow ague is not considered a neuralgia of the classical type, although there is a disturbance of the vasomotor nerve trunks. No spots of tenderness will be found along the course of the nerve trunks. Certain individual susceptibility seems to be involved since the same degree of congestive swelling may be present in other patients without causing the same amount of pain and discomfort. It is pointed out that the pain is always increased on bending the body forward, as in picking anything from the floor. Swelling and congestion of the nasal mucosa are invariably found, especially on the middle turbinate. A careful examination of the nose in cases of periodical headache is advised.

CLEMENS.

108. BERENS, T. P. *The results of operation by way of the maxillary route for combined disease of the maxillary antrum, ethmoid labyrinth, and sphenoid sinus.*

The twenty operated cases show the following results: Eleven cases have been cured: seven for two years, two for one year, one for six months, one for four months. Three of these were cases of unilateral pansinusitis. Five cases with atrophic mucous membranes before operation, two of which were specific and with frontal-sinus disease, were vastly improved. Four cases had "tic douloureux," nine grippe, and four coryza. Fifteen had interference with the sense of smell, one a stricture of the tear duct. Two have disappeared from observation.

M. TOEPLITZ.

109. COFFIN, L. A. *The external operation for the relief of ethmoiditis.*

In operation upon the ethmoids two principles should be guiding: 1. All diseased parts or cells must be reached. 2. No healthy part should be sacrificed and, therefore, where most anterior cells are diseased, or the ethmoidal cells extend over the orbit, and in children previous to the descent of the second teeth, an external opening through the nasal process of the superior maxilla or through the os planum is the operation of necessity. This method should not be used, unless the anterior cells were involved, except in children.

M. TOEPLITZ.

110. RICHARDS, G. L. *Personal experiences with empyemata of the frontal sinus.*

Of fifteen cases cited elaborately by Richards, ten were operated upon: In seven the sinus was opened at the inner angle of the eye, nasal drainage established with subsequent closure of the external wound after a varying period, the so-called Ogston-Luc method or some modification of it. Of these two showed a cure without recurrence, four had one or more recurrences with final cure, one was certainly cured by obliteration, the others probably; one is still under treatment. Three cases were treated by the method of obliteration, and of these there have been no recurrences. The cases which showed recurrence were all accompanied by more or less ethmoidal suppuration or occurred in connection with maxillary-antrum suppuration. As to the choice of operation, Richards urges first to try the intranasal method of treatment, then, in simple suppuration, not long-continued, the simple opening and draining the sinus with closure of the external wound. In cases associated with ethmoidal or even those of the other sinuses, some form of the obliteration method is chosen; but which, whether Jansen's, Coakley's, Killian's, can hardly be determined, until the patient is on the table and the sinus opened, according to the extent of the pathological condition and the cosmetic result expected.

M. TOEPLITZ.

111. WELLS, W. A. *The intranasal route in operating upon the nasal accessory sinuses.*

The objections to the employment of the nasal route in the treatment of the accessory sinuses are: That it is not practicable, viz., in some cases; that valuable time is lost postponing radical measures, which is most commonly urged against conservative treatment; that the nasal methods are generally slow and tedious; that they are uncertain as to results. However, a great many cases get well under conservative treatment. If a true sinusitis can be established with reasonable certainty and if chronic polypoid changes have already taken place, an immediate radical operation is indicated. In all other cases the nasal route should be given a trial. Then the different intranasal routes to the maxillary antrum, ethmoid cells, the frontal, and sphenoid are separately and fully discussed.

M. TOEPLITZ.

d.—OTHER NASAL AFFECTIONS.

112. SCHILLING. A new method of rhinoplasty. *Norsk magasin for lægevidensk*, 1906, p. 94.

113. HANAU. The treatment of hay-fever with serum. *Arch. internat. d'otol.*, etc., vol. xxi., p. 134.

114. HEYNINX. A scintillating scotoma and hypertrophy of the middle turbinal. *Arch. internat. d'otol.*, etc., vol. xxi., p. 206.

115. KAHLER. Supernumerary tooth in the nose; a contribution to the question of high palate. *Wiener klin. Wochenschr.*, No. 40, 1905.

116. INGALS and FRIEDBERG. The treatment of hypertrophic and intumescent rhinitis. *Annals Otol., Rhinol., and Laryngol.*, March, 1906.

117. KOPETZKY. The diagnostic significance of headache in diseases of the ear, nose, and throat. *N. Y. and Phil. Med. Journ.*, Dec. 2, 1905.

118. SOMERS. The antitoxin treatment of hay-fever. *Laryngoscope*, May, 1906.

119. GRIFFIN. Turbinectomy. *Medical Record*, Apr. 14, 1906.

120. HARRIS. Eucain lactate as an anæsthetic for operations on the nose and throat. *American Medicine*, Dec. 30, 1905.

121. WEIGERT-STERNE. The treatment of hay-fever. *N. Y. and Phil. Med. Journ.*, Oct. 28, 1905.

122. DUFFEE. New nasal snare. *Journ. Amer. Med. Assoc.*, Apr. 7, 1906.

112. SCHILLING. A new method of rhinoplasty.

The method of Fritz Koenig (implantation of a piece of the concha auris) gave good results in three patients.

JOERGEN MOELLER.

113. HANAU. The treatment of hay-fever with serum.

The author is in favor of Dunbar's serum treatment, which has been of service to him in a number of cases.

OPPIKOFER.

114. HEYNINX. A scintillating scotoma and hypertrophy of the middle turbinal.

Report of two cases of hypertrophy of the middle turbinal with simultaneous scintillating scotoma. The latter symptom disappeared after correction of the nasal trouble.

OPPIKOFER.

115. KAHLER. Supernumerary tooth in the nose; a contribution to the question of high palate.

A man twenty-nine years of age with defect of the nasal

septum presented about one-half inch from the introitus a white structure which proved to be a root of a tooth. The position of the tooth was demonstrated by an X-ray picture. The extraction was difficult and the tooth was swallowed.

The unusual height of the hard palate depended on the fact that it was not properly incorporated, as the congenital syphilis had destroyed the cartilaginous and the bony septum.

WANNER.

116. INGALS and FRIEDBERG. *The treatment of hypertrophic and intumescent rhinitis.*

Fifty cases of rhinitis hypertrophica and fifty cases of the intumescent form of rhinitis were selected for the purpose of demonstrating the value of the galvano-cautery in the treatment of these conditions. The observations had been carried sufficiently far to serve as a reliable basis of comparison, and the conclusions reached are: That the cautery is one of the best if not the best method for treating these conditions. The dangers of middle-ear infection have been exaggerated, no such complication having occurred in any of this class of cases. Adhesion formation will not occur if the mucous membrane of the opposite side is not injured. If the cauterization is linear, very little mucous membrane is destroyed. Scab and crust formation does not occur oftener than following other forms of nasal operations. No packing of the nose is needed to prevent hemorrhage.

CLEMENS.

117. KOPETZKY, S. J. *The diagnostic significance of headache in diseases of the ear, nose, and throat.*

After having pointed out in a general way some of the characteristics of headache in the domain of general medicine, Kopetzky deals more closely with headaches whose causes are the ear, nose, and throat. Cephalalgia pharyngo-tympanica is due to acute and chronic middle-ear disease. A series of headaches referable to the ear are "reflex neuroses," showing themselves in migraine. Nasal headache is due to general hyperæsthesia of the nasal mucous membrane. Diffuse headaches are a stable characteristic of involvement of accessory sinus disease; with an acute exacerbation, neuralgic

pains, localizing themselves in the neighborhood of the affected part, take their place.

M. TOEPLITZ.

118. SOMERS. *The antitoxin treatment of hay-fever.*

A larger experience with the antitoxin of Dunbar has given the author the following results: It produces prompt and positive amelioration of the symptoms in a large majority of the cases, and in a smaller number this is accompanied with complete disappearance of the affection for that season. Where slight or no action follows its use, is either due to its improper administration or to some idiosyncrasy. It favorably influences all the manifestations of hay-fever in the larger number of cases, while in a smaller class one or more of the symptoms seem to be influenced. When given during an attack, it produces palliation rather than a cure. When successfully used during one season, it does not prevent the occurrence of the disease the following season, although there does appear to be a slight influence in modifying future attacks. It is effective in both liquid and powder form but the latter is preferable.

CLEMENS.

119. GRIFFIN. *Turbinectomy.*

Griffin does not believe in complete turbinectomy and advises where the operation is required that only sufficient bone should be removed to restore the normal calibre of the canal. The great objection the author has to complete turbinectomy is, that it makes the passage too large and removes something that has a function to perform. Partial turbinectomy, on the other hand, only restores the normal anatomy. Where it has been found that infection of the ears is present, the operation has given relief and caused improvement in the deafness beyond dispute. Up to the present he has operated on over ten thousand cases and in all the aim of the operation has been secured.

CLEMENS.

120. HARRIS, T. J. *Eucaïn lactate as an anæsthetic for operations on the nose and throat.*

Harris considers beta eucain lactate an excellent substitute for cocain. It may be employed in the strongest solutions without fear of toxic symptoms. Its anæsthetic power is not quite so great as cocain; a 15 per cent. to 20 per cent. solution

of eucain lactate would correspond to a 10 per cent. solution of cocain. For injections, 20m. to 30m. of a solution of eucain is used.

M. TOEPLITZ.

121. WEIGERT-STERNE, L. *The treatment of hay-fever.*

Since the toxic proteid of pollen is readily disintegrated by alkalies, Weigert-Sterne recommends the use of sodium bicarbonate in powder or saturated solution, which will ameliorate the attack of hay-fever, provided the toxine already absorbed has been entirely eliminated.

M. TOEPLITZ.

122. DUFFEE. *New nasal snare.*

The special feature of this instrument is the pistol-grip handle, which allows the operator an unobstructed view and an easy natural position of the hand and fingers. It is made from nickled tubular brass, is well reinforced, is strong and durable. A description of the instrument is given in full.

CLEMENS.

e.—NASO-PHARYNX.

123. MOURE. Adenoid vegetations in the new-born. *Allgemeine Wiener medizinische Zeitung*, No. 52, 1905.

124. LANGE. On enuresis as a neuropathic condition depending upon adenoid vegetations. *Wiener med. Presse*, No. 52, 1905.

125. FEIN. The removal of the pharyngeal tonsil with a bayonet-shaped adenotome. *Wiener med. Wochenschrift*, Nos. 45 and 46, 1905.

126. ROUSSET and ROYET. Psychical disturbances of a rhinopharyngeal organ. *Arch. internat. d'otol.*, etc., vol. xxi., p. 92.

127. STEIN. A case of congenital membrane in the naso-pharynx. *Wiener klin. Rundschau*, No. 42, 1905.

123. MOURE. *Adenoid vegetations in the new-born.*

If the suckling cannot breathe or take the breast and respiration is interfered with, the operation can be performed 14-20 days after birth. Otherwise it is better to wait till the seventh or eighth month. The best instrument is Gottstein's with the modification of Delstanche. As it is impossible to remove everything in the skull, it is better to see the children at about the fifth year again. If the operation is undertaken during the period of weaning it is possible to observe the re-formation of the naso-pharyngeal follicles in a short time. Consequently the operation should be performed only in threatening cases.

WANNER.

124. LANGE. *On enuresis as a neuropathic condition depending upon adenoid vegetations.*

The author has observed thirty-nine children who suffered from enuresis. The age varied from three to ten years; boys were affected twice as often as girls. In eight cases there were adenoid vegetations, in three hypertrophic nasal catarrh. After removal of the pharyngeal tonsil there was no result in seven and a doubtful one in one case. Hence the author believes that the accepted theory that enuresis depends upon adenoid vegetations is incorrect; he believes that the condition depends upon a neuropathic condition and recommends arsenic, iron, and iodine.

WANNER.

125. FEIN. *The removal of the pharyngeal tonsil with a bayonet-shaped adenotome.*

The author describes the advantages of his instrument over the others. Narcosis is unnecessary.

WANNER.

126. ROUSSET and ROYET. *Psychical disturbances of a rhino-pharyngeal organ.*

The melancholic thoughts and attempts at suicide of this patient disappeared after the division of the adhesion in the nasopharynx.

OPPIKOFER.

127. STEIN. *A case of congenital membrane in the nasopharynx.*

A patient twenty-eight years of age was treated on account of deafness for catarrh of the tubes. Posterior rhinoscopic examination revealed behind the choanæ a grayish red membrane which permitted a view into the nasal cavity through two oval openings through which the lower and middle turbinates could be observed. The membrane was adherent to the posterior end of the septum. From the roof of the pharynx this membrane descends and covers the tubal prominence, so that on performing the air douche the air did not enter into the tubes. This membrane is supposed to have been congenital.

WANNER.

SOFT PALATE, PHARYNX, AND MOUTH.

128. BAIRASCHEWSKI. *A case of complete adhesion of the soft palate to the posterior pharyngeal wall with simultaneous atrophy of both tonsils.* *Russkij Wratsch*, No. 31, 1905.

129. RENNERT. *Tuberculosis of the tonsils, a further contribution*

to treatment with the new tuberculin. *Deutsche med. Wochenschrift*, No. 3, 1906.

130. SOMMER. The treatment of abscess of the tonsil. *Munch. med. Wochenschr.*, 1906, No. 11.

131. LAUB. A peculiar change of the tongue in cardiac insufficiency. *Wiener med. Wochenschrift*, No. 10, 1906.

132. WRIGHT. Cysts in lymphatic tissue, an exceptional manifestation of tonsillar retrogression. *The Laryngoscope*, September, 1905.

133. TODD. Extirpation of the faucial tonsil. *St. Paul Med. Journ.*, December, 1905.

134. RICHARDSON. Gangrene of the tonsil. *Amer. Journ. Med. Science*, October, 1905.

135. SMITH. An operation for cleft palate. *American Journ. Surgery*, March, 1906.

136. ROBERTS. A new instrument for excision of the tonsils. *Laryngoscope*, March, 1906.

137. SCHADLE. Correct treatment of syphilitic adhesions between the soft palate and the posterior wall of the pharynx. *St. Paul Medical Journ.*, March, 1906.

128. BAIRASCHEWSKI. A case of complete adhesion of the soft palate to the posterior pharyngeal wall with simultaneous atrophy of both tonsils.

There was a perforation of the hard palate. Following this there was an adhesion to the posterior wall of the pharynx. The atrophy of the tonsils is also explained by the extension of the syphilitic ulceration.

SACHER.

129. RENNERT. Tuberculosis of the tonsils, a further contribution to treatment with the new tuberculin.

In a case of tuberculosis of the tonsils which was difficult to diagnosticate there was a white membrane which covered the tonsil, which was in no way characteristic of tuberculosis. The diagnosis was, however, proven by the microscopic examinations and the animal experiments. Treatment with the new tuberculin led to recovery. The author does not consider this a case of primary tonsillar tuberculosis, because the patient had suffered for a long time before the onset of the throat affection with a lung trouble and involvement of the lymphatic apparatus.

NOLTENIUS.

130. SOMMER. The treatment of abscess of the tonsil.

Recommendation of the tonsillotome as the best means of opening tonsillar abscesses.

SCHEIBE.

131. LAUB. *A peculiar change of the tongue in cardiac insufficiency.*

The author observed in a patient twenty years of age, suffering from insufficiency of the mitral valve and stenosis of the left venous ostium, regularly with the onset of the acute insufficiency changes in the tongue which disappeared as soon as the heart's action returned to normal. The tongue would then be swollen, the mucous membrane relaxed and broken with numerous furrows. At the margin of the tongue and also on the dorsum of the tongue there were a number of spots which looked like ulcers and which were surrounded by a grayish yellow wall. They were painless. On the administration of digitalis the symptoms disappeared in two days, to recur after an interval of 14-20 days. The symptoms are supposed to have been due to the insufficiency of the tricuspidalis.

WANNER.

132. WRIGHT. *Cysts in lymphatic tissue, an exceptional manifestation of tonsillar retrogression.*

A large amount of oily substance escaped from the lymphoid tissue of the naso-pharynx of a woman aged twenty-one. In the specimen the cavity had been ruptured, and having no true walls it could not be recognized, but several smaller cavities containing fat cells were seen.

M. TOEPLITZ.

133. TODD, F. C. *Extirpation of the faucial tonsil.*

Todd removes in the majority of cases the faucial tonsils under a general anæsthetic, dropping the head over the end of the table. He grasps the tonsil with the tonsil forceps, dissects with tonsil knives the tonsil loose from the anterior pillar, taking care not to injure the pillar, from which most hemorrhages arise. With a pair of slightly curved scissors the tonsil is separated above and below, pulling it out all the time; the forceps is then released and the cold wire snare applied. Bleedings from the cut pillar are stopped by ligating the pillar.

M. TOEPLITZ.

134. RICHARDSON, C. W. *Gangrene of the tonsil.*

Richardson reports two cases of gangrene of tonsil, which together with three other cases given by him in abstracts are the only cases found by him in medical literature. The first

case, a man of forty-five, an alcoholic, had a marked infiltration of the right side of the neck, then a discharge from nose and mouth, followed by subsidence of swelling and thin white spots on the right tonsil. No improvement from antitoxin. On the ninth day delirium, on the tenth peculiar odor of sloughing tissue. On the right side the tonsil, anterior and posterior pillar down into the pharynx was one continuous mass of grayish, brownish, putty-like slough with a complete line of demarcation between the normal and necrotic tissue. Death on the tenth day. M. TOEPLITZ.

135. SMITH. *An operation for cleft palate.*

The operation suggested has for its purpose not only the closure of the cleft, but the actual production of a new muscular velum and all the requirements of deglutition and phonation. Ten cases have been operated upon in the way described with satisfactory results.

From the anterior end of the cleft an incision is made running outward and a little backward toward the alveolus about one-third distance to the teeth, where the incision is changed, then it is carried in a straight line nearly to the posterior extremity of the alveolar process. Sufficient tissue must be left where the incision ends for the blood supply of the flap. A corresponding incision is made on the opposite side, the two flaps with the periosteum are dissected up from the bone and are freed from the posterior edge of the palate bones behind. A curvilinear incision is now made on each side beginning near the last molar where the preceding incisions terminate, keeping close to the roots of the teeth. Two triangular flaps are thus formed of mucous membrane and periosteum which are carried into the median line and sutured. The freshened edges of the velum are now sutured and the posterior edges of the anterior flaps are sewn to the middle of the newly-formed velum. Tension is guarded against by extra sutures. CLEMENS.

136. ROBERTS. *A new instrument for excision of the tonsils.*

The cutting part of this instrument is patterned after the jaws of the old-fashioned steel trap and is adjustable for

right or left, up or down. The bite is directed outward toward the base of the tonsil, and its depth is easily regulated by pressure on the handle of the instrument. The blades are so shaped as to easily pass in between the pillars of the fauces without any possible injury thereto. CLEMENS.

137. SCHADLE. *Correct treatment of syphilitic adhesions between the soft palate and the posterior wall of the pharynx.*

The device here suggested and advised is composed of an obturator and a palatine plate, made preferably of vulcanite, which is designed to hold the obturator in place by means of dental clasps. The apparatus is to be continually worn in order to keep apart permanently the opposing surfaces of the soft palate and postpharyngeal wall. It should never be introduced, however, until the acute symptoms and tissue necroses have subsided. In the chronic cases the device should be immediately employed after complete detachment of the adhesions. The author's method of operation and the details for making the obturator are described in detail.

CLEMENS.

REPORT ON THE PROGRESS IN OTOTOLOGY DURING THE SECOND QUARTER OF 1906.

BY PROF. ARTHUR HARTMANN, BERLIN.

Translated by Dr. ARNOLD KNAPP.

ANATOMY AND PHYSIOLOGY,

138. FREY. *On the anatomy of the temporal bone.* *Arch. f. Ohrenheilk.*, vol. lxxviii., p. 41.

139. GAUDIER and DESCARPENTRIES. *The anatomy of the mastoid vein.* *Annales des mal. de l'oreille, etc.*, December, 1905.

140. WAGENER. *The function of the ceruminous glands.* *Charitéannalen*, vol. xxx., Jahrgang.

138. FREY. *On the anatomy of the temporal bone.*

This paper deals with the outlines of the three parts of the temporal bone (the squamous, the petrous, and the tympanic parts), as they appear in an adult. These parts are easily separated from one another in the new-born. Later they become firmly adherent and the limits are frequently to be distinguished only with difficulty. In this particular bone of an adult the divisions between these three areas were distinctly seen as they were loosely attached to one another. The temporal bone is carefully described with the aid of very successful pictures and the topographical peculiarities are given.

ZARNIKO.

139. GAUDIER and DESCARPENTRIES. *The anatomy of the mastoid vein.*

This is a very careful study. The mastoid vein after leaving the sigmoid sinus passes through the mastoid emissary in a direction from before backward and carries its blood to the occipital venous plexus which is covered by the splenius muscle. Varieties in its development frequently occur. This is especially of importance to the aurist, who is apt to come in conflict with the vein in searching for a cerebellar

abscess. It may vary in size from the thickness of the small finger to complete absence. BOENNINGHAUS.

140. WAGENER. *The function of the ceruminal glands.*

Many ceruminal glands contain fat, though the fat is attached only to the pigment granules in the cells. There is no fat to be seen in the lumen of the glands. Consequently we cannot affirm that the ceruminal glands produce cerumen. This is probably the product of the sebaceous glands in the auditory canal.

The function of the ceruminal glands, on the other hand, is to carry away the cerumen. The cerumen mixes readily with the watery fluid secreted by the ceruminal glands, and this furnishes enough fluid for the canal.

The pigment of the ceruminal glands is not secreted. It is morphologically and chemically different from the pigments in cerumen itself which is the result of the disintegration of the fat. HARTMANN.

GENERAL.

a.—REPORTS.

141. IMHOFER. *Diseases of the ear and throat in idiots.* Selbstverlag, Wien.

141. IMHOFER. *Diseases of the ear and throat in idiots.*

Imhofer examined 108 inmates and found thirty-six with enlarged pharyngeal tonsils, in twenty-six they were of a middle size, in forty-six the tonsils were small. Of seventy-four inmates who could be examined for their hearing, thirty-six heard 51.36 per cent. beyond whisper at 6 m. Fourteen inmates suffered from deafness which was an inconvenience in study. HARTMANN.

b.—GENERAL PATHOLOGY AND SYMPTOMATOLOGY.

142. WAGNER. *Demonstration of sequestrum of the temporal bone obtained during a mastoid operation.* *Annals Oto., Rhino., and Laryng.*, June, 1906.

143. SMITH MACCUEN. *An unusual growth of the mastoid process, fibro-chondro-osteoma of the mastoid antrum.* *Annals. Oto., Rhino., and Laryng.*, June, 1906.

144. BLOCH. *Dysthyric deafness.* *Deutsch. Arch. f. klin. Med.*, vol. lxxxvii.

145. KATZ. *So-called otosclerosis in the cat.* *A. f. O.*, vol. lxviii., p. 122.

146. VOSS. The bacillus pyocyaneus in the ear. *Veröffentl. a. d. Gebiete d. Militär-Sanitätswesens.* Berlin, 1906, Verl. A. Hirschwald.

147. LERMOYEZ. Affections of the ear produced by the bacillus pyocyaneus. *Ann. des mal. de l'oreille, etc.*, October, 1905.

148. BÁRÁNY. On counter-rotation of the eyes induced by the aural labyrinth in those with normal ears, in the deaf and deaf-mutes. *A. f. O.*, vol. lxviii., p. 1.

149. BECHTEREW. An unusual auditory and acoustic palpebral reflex. *Obosrenje psichiatrit, neurologii i experimentalnoj psichologii*, 1905, book 2.

142. WAGNER. *Demonstration of sequestrum of the temporal bone obtained during a mastoid operation.*

Patient, male, aged forty, fell from his wagon striking the back of his head. He bled from the nose, ear, and mouth, was unconscious for several hours, and had pain and intense swelling back of the left ear. At the time seen by the writer (two months after the accident) there was considerable discharge from the ear. During an extensive mastoid operation a sequestrum was found in its petrous portion. It measures 2 cm. long and 1 in width. Whether it was formed by the process of streptococcic osteomyelitis or by fracture, or by both, is difficult to determine.

CLEMENS.

143. SMITH MACCUEN. *An unusual growth of the mastoid process, fibro-chondro-osteoma of the mastoid antrum.*

Patient, boy aged sixteen, several years ago had had measles, and later typhoid fever from which no aural complication followed. At the operation the entire mastoid process was of the eburnated variety until the antrum was reached, which gave the impression that the case was of the usual chronic variety notwithstanding the statements of the family to the contrary. The antrum and tympanic cavity were extensively involved in the necrotic process, while the malleus and the incus had become disintegrated. The tumor was located in the inferior and anterior part of the antrum, and filled the concavity caused by the more or less drooping of the canal adjacent to the hyperostosis. The specimen was an ovoidal mass 1 cm. long, 0.6 cm. wide, and 0.3 cm. thick; weight 0.2 gm. Surface smooth, glossy, slightly nodular, and greyish-pink in color. The tissue is hard at some points

and soft and elastic at others. Microscopical report is included in the paper.

CLEMENS.

144. BLOCH. *Dysthyric deafness.*

After examining clinically 100 persons suffering with goitre, Bloch originates Dysthyric Deafness, which in its most marked stages passes directly into cretinic deafmutism. Dysthyric deafness is a nervous deafness and the anatomic situation is probably to be found beyond the labyrinth. Prognosis must be guarded. Treatment with thyroid tablets should be continued through the entire life.

BRUEHL.

145. KATZ. *So-called otosclerosis in the cat.*

In a cat twenty-three years of age which had never borne kittens and in whom in the last years deafness with the presumable presence of subjective tinnitus was observed, the following conditions were found on microscopic examination: Bilateral extensive old otosclerosis, not only of the labyrinth capsule but in the other parts of the temporal bone. The areas are to a great extent united though many still remain disseminated. The joint surfaces of all the ossicles are free. There is a distinct partial degeneration and atrophy of the cochlear nerve. Very marked disappearance of the ganglion cells in the lower and partly in the middle whorl of the cochlea. Corti's organ in the lowest turn is distinctly atrophic, while it is normal in the upper areas. There is ankylosis of the stapes. There are, moreover, sarcomatous tumors in the abdomen and in the midbrain.

The author then repeats his views on the characteristics of otosclerosis. He believes that the bone disease which leads to osteoporosis is a constitutional one usually of an inherited nature (rheumatic-gouty diathesis, syphilis, scrofulosis, neuro-paralysis). On the basis of this disposition a number of exciting causes may produce the otitis, such as catarrhs of the middle ear, occlusion of the tube, affections of the nasopharynx.

Regarding treatment, the author warns against too frequent treatment, especially against intratympanic injections. He recommends warm baths, anti-rheumatic mineral waters, arsenic, cod-liver oil, phosphorus. Cold-water treatment is distinctly contra-indicated.

ZARNIKO.

146. Voss. *The bacillus pyocyaneus in the ear.*

The author has endeavored to solve the pathogenesis of the bacillus pyocyaneus in the ear. He finds that this bacillus occurs in a variety of ear diseases in the auricle, the auditory canal, middle ear, and mastoid process as a saprophyte or as a pathogenic organism. The pathogenesis is proven from the microscopic and bacteriologic presence of this organism in the discharge and when the disease is cured after the bacillus has been destroyed; moreover, by successful inoculations and by agglutinative tests. Only in the more advanced stages of a severe inflammation of the auricle, as occurs principally after the radical operation, certain peculiarities in the clinical course seem to depend upon the presence of the pyocyaneus. One of the most active means of combating this infection is pure boric acid.

BRUEHL.

147. LERMOYEZ. *Affections of the ear produced by the bacillus pyocyaneus.*

If the yellowish pus in chronic purulent otitis becomes bluish-green, a secondary infection with pyocyaneus is present. This has a tendency to cause a very painful diffuse inflammation of the meatus with or without a croupous exudate, or perichondritis, which may lead to a deformity of the auricle as is observed after the radical operation. The pyocyaneus rarely invades the healthy ear, though it may primarily produce a purulent otitis. The exudate in that case is characterized by its sero-sanguinolent nature. So-called idiopathic perichondritis, according to Lermoyez, is nothing but a primary infection of the perichondrium by the pyocyaneus. He has endeavored to show in the case of the rabbit the tendency the pyocyaneus has to affect the perichondrium.

BOENNINGHAUS.

148. BÁRÁNY. *On counter-rotation of the eyes induced by the aural labyrinth in those with normal ears, in the deaf and deaf-mutes.*

Counter-rotation of the eyes is a peculiar movement of the eyeballs which appears when the head is moved from its upright position towards one shoulder. The eyeballs under these circumstances do not preserve their position in the

orbit but perform a rotation in an opposite direction to the head. Transient and permanent counter-rotations are distinguished. The transient rotation is a symptom of a rotary system which occurs during the turning of the head. The permanent counter-rotation continues in the new position of the head. The latter has been examined in this paper.

A peculiar instrument has been constructed in order to observe and to measure this rotation. Nineteen normal and thirty-two patients suffering from the ears, but without vertigo, were examined. Both showed no differences. With the aid of these fifty-one cases the pathological cases (fifty-five) are compared.

The results are as follows: 1. In the presence of a one-sided destruction of the vestibular apparatus, examination of counter-rotation does not show us anything. We have better methods of examination which show us indubitably the destruction on one side. 2. If the vestibular apparatus is destroyed on both sides, the examination of rotation of the eyes confirms the results which have been obtained with certainty by other methods. 3. Of clinical importance is an examination of counter-rotation in those cases which suffer from vertigo. A single examination sometimes in these cases may show that an organic cause is present for the vertigo, while a frequently observed normal condition of counter-rotation suggests simulation or neurosis. Therefore the examination of counter-rotation is of importance in forensic cases, where it may even be decisive. On the other hand, it is of importance to differentiate an organic from a neurotic vertigo and thus help us in the treatment.

Theoretically the author believes that the counter-rotation emanates partly from the vestibular apparatus. In opposition to Nagel, he thinks it very likely that the nerve terminals are situated in the semicircular canals. ZARNIKO.

149. BECHTEREW. *An unusual auditory and acoustic palpebral reflex.*

This reflex, described in 1903, consists in a closure of the lids on an unexpected noise and is supposed to pass along the collateral tracts leading from the central tracts of the auditory nerve to the nucleus of the facial nerve. The investigation

of this question on clinical material has shown that this reflex is of some importance in cases where deafness is simulated. In other cases where deafness is of labyrinthine origin and in those where deafness is caused by an affection of the central distribution of the auditory nerve within the skull the reflex is absent. In cases of peripheric lesions of the facial nerves the reflex is diminished on the side of the lesion, while in central facial paralysis it is usually preserved. An exaggeration of the auditory reflex was observed in cases of hyperæsthesia of the auditory nerve which sometimes is observed in catarrhal affections. In some cases of progressive paralysis the two auditory reflexes on the two sides proved uneven. In certain functional neuroses, especially in hysteria, the reflex is somewhat exaggerated.

SACHER.

C.—METHODS OF EXAMINATION AND TREATMENT.

150. BLEGVAD. On Rinne's test, and on the determination of the duration of perception of tuning-forks. *A. f. O.*, vol. lxvii., p. 280.

151. CHAVANNE and TROUILLIEUR. Intracranial section of the auditory nerve. *Annales des mal. de l'oreille*, etc., Sept., 1905.

152. MATTE. Operations on the labyrinth on account of annoying tinnitus in sclerosis. *Deutsche med. Wochenschr.*, No. xxi., 1906.

153. NEUMANN. On local anæsthesia in aural surgery. *Deutsche med. Wochenschr.*, No. 15, 1906.

154. LOHNBERG. On the treatment of mouth-breathing and chronic occlusion of the tubes with extension of the palate after Schroeder. *Deutsche med. Wochenschr.*, No. 18, 1906.

155. SONDERMANN. Further experience with my nasal aspirator. *Arch. f. Laryngol.*, vol. xxvii., book 3.

156. LENNHOFF. Tamponade of the nose and of the nasal pharynx. *Arch. f. Laryngol.*, vol. xviii., book 1.

157. ONODI. A syringe to use with hard paraffin. *Arch. f. Laryngol.*, vol. xviii., book 1.

158. UFFENORDE. Experience with Merk's stypticin cotton. *Arch. f. Laryngol.*, vol. xviii., book 2.

159. FINDER. Alypin in rhino-laryngologic practice. *Berl. klin. Wochenschr.*, 1906, No. 5.

150. BLEGVAD. On Rinne's test, and on the determination of the duration of perception of tuning-forks.

Rinne's test is usually performed by observing after striking the same tuning-fork the difference of perception between the air- and bone-conduction. This has the very great advantage

that the size of the instrument employed is of no importance. Notwithstanding, the author objects to this proceeding because in certain cases the same tuning-fork in the same individual may give a positive and a negative result of this test. He pleads, therefore, to make use of the fundamental numbers in their true values. Here it is necessary to always begin with the same incipient amplitudes. It must be taken for granted that an examiner has had a certain amount of practice in striking the tuning-fork to equalize the differences which are likely to be sources of error. A number of very excellent mechanical devices have been adopted to serve this purpose. The author, nevertheless, has thought it necessary to construct a new instrument of this kind. In this case the tuning-fork is set in vibration through the blow of a pendulum which always falls from the same height after the release of a spring. After the blow has been struck, the tuning-fork is released from the apparatus and is applied to the ear or to the bone of the patient to be examined.

The reviewer thinks this apparatus is unnecessarily complicated and that the chance of errors is greater than in the ordinary procedure. The rapidity with which the tuning-fork is released from the apparatus must produce a loss of a certain amount of tone and exert an influence on the result of the test.

ZARNIKO.

151. CHAVANNE and TROUILLIEUR. *Intracranial section of the auditory nerve.*

In insupportable tinnitus and vertigo the auditory nerve may be divided as a last resort. In the case of the author, the dura was lifted from the upper surface of the petrous pyramid, the upper wall of the internal auditory meatus was chiselled away, and the nerve was isolated in the canal and divided. Death three days later. No autopsy. The case of Parry was operated on in the same manner. The auditory nerve, however, was only partly destroyed because the result was only a partial one, while the facial remained permanently paralyzed. In the case of Wallace and Marriage it was attempted to find the auditory nerve after dividing the dura and retracting the brain from the petrous pyramid. Death three weeks later: softening of the cerebellum; a thin

strand of the auditory nerve proved to be undivided. The bad prognosis is explained by the inaccessibility of the auditory nerve. It would seem to the reviewer very much easier to endeavor to destroy the terminal distribution of the nerve by curetting the labyrinth after a radical operation and after the labyrinth has been opened.

BOENNINGHAUS.

152. MATTE. *Operations on the labyrinth on account of annoying tinnitus in sclerosis.*

After some introductory remarks on the characteristics of otosclerosis, the case-history of one man is given who was so annoyed by the subjective noises in his ear as to think of suicide. Under these conditions the author decided to open the labyrinth according to Passow, hoping thereby to give the patient some relief. The patient seemed to be permanently and nearly completely relieved of the tinnitus. The hearing was at first improved but later returned to the condition it was in before the operation. The operation was performed as follows: Under chloroform narcosis, an opening 3mm in size was made directly underneath the stapes adjoining the round and oval windows. This permitted the introduction of a Kessel curette and the Schwartze tenotomy probe and the vestibule was curetted. A slight escape of endolymph was noticeable. The course of healing was undisturbed and the symptoms of vertigo were unimportant.

NOLTENIUS.

153. NEUMANN. *On local anæsthesia in aural surgery.*

Neumann believes from his experience that Braun's statement that local anæsthesia is not of service in major ear operations is incorrect, and insists, contrary to von Eicken, that his method furnishes complete anæsthesia of the drum and of the tympanic mucous membrane, so that the operation on the drum, including extraction of the hammer and anvil, may be performed, and that even complete exenteration of the middle-ear cavities may be performed in almost all cases without pain. In order to anæsthetize the middle-ear cavities, the cocain-adrenalin solution is heated to 50° C. and injected in the region of the upper bony canal wall. In operations in

the mastoid process the injecting needle is first introduced down to the bone and then straight forward. A quantity of 3-4ccm. is sufficient to render the operation free from pain.

NOLTENIUS.

154. LÖHNBERG. *On the treatment of mouth-breathing and chronic occlusion of the tubes with extension of the palate after Schroeder.*

It is well known that a narrow nose, even without swelling of the mucous membrane and without adenoids, leads to mouth-breathing, occlusion of the tubes, and deafness. An apparatus has been produced by a dentist which in the course of six months to a year exerts a steady and increasing pressure on the hard palate whereby it becomes more shallow and the respiratory fissure of the nose is dilated. One case has been observed which has been treated by this method with very good success.

NOLTENIUS.

155. SONDERMANN. *Further experience with my nasal aspirator.*

The author has found that the scabs in ozæna are easily displaced. Acute suppurations of the accessory cavities are cured after one to two weeks. One case of chronic empyema was also cured by this method.

VON EICKEN.

156. LENNHOF. *Tamponade of the nose and of the naso-pharynx.*

All objections to packing the nose are avoided by the use of Lennhoff's tampon. This is a strip of gauze which is knotted at the end introduced. There is a thread connected with the knot round which the remainder of the strip is wound. The knot is introduced through the nose into the naso-pharynx and swells from the blood. On pulling on the thread, the knot becomes firmly caught in the choanæ. On pulling this thread as much of the gauze strip is introduced into the nose as is necessary to arrest the bleeding.

VON EICKEN.

157. ONODI. *A syringe to use with hard paraffin.*

The syringe can be boiled and permits the injection of hard paraffin in a fine thread.

VON EICKEN.

158. UFFENORDE. *Experience with Merk's stypticin cotton.*

This is a recommendation of stypticin cotton for dispensary use, especially after operations on the lower turbinals.

VON EICKEN.

159. FINDER. *Alypin in rhino-laryngologic practice.*

In union with others the author finds alypin to have the following advantages:

1. Lessened toxicity.
2. The solution may be sterilized by boiling.
3. Its vaso-dilator action is contrasted with the vaso-constrictor action of cocain.

The author recommends either the application of a 20 per cent. solution or the submucous injection of a 1 per cent solution with adrenalin. Alypin seems well suited for endolaryngeal surgery, as it has the same effect as cocain and is not so unpleasant.

MUELLER.

EXTERNAL EAR.

160. RICARD. *The surprises of cerumen.* *Arch. internat. d'otol.*, etc., vol. xxi., p. 45.

160. RICARD. *The surprises of cerumen.*

In three old people after removal of cerumen there was a distinct diminution of hearing. The author believes that in these cases the articular connections in the middle ear had become loose on account of the patients' age and owing to the pressure of the wax the hearing was improved.

OPPIKOFER.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

161. CHAUVEAU. *Mastoiditis of nurslings without apparent involvement of the tympanum.* *Arch. internat. d'otol.*, etc., vol. xxi., p. 469.

162. LANNOIS. *Relapsing and alternating facial paralysis of otitic origin.* *Ann. des mal. de l'oreille*, etc., July, 1905.

161. CHAUVEAU. *Mastoiditis of nurslings without apparent involvement of the tympanum.*

A number of cases of mastoiditis are described which occurred in nurslings where there was no apparent involvement of the tympanum. The author explains this isolated

inflammation of the antrum in the early age by the insufficient development of the air cells and the large quantity of blood-vessels and cellular elements which surround the antrum. According to the reviewer, these were probably cases of pneumococcus otitis in which the inflammatory process in the tympanum healed rapidly and continued in the antrum.

OPPIKOFER.

162. LANNOIS. *Relapsing and alternating facial paralysis of otitic origin.*

Facial paralysis coming on in the course of a middle-ear catarrh of favorable prognosis probably occurs more frequently than we imagine and is due to an extension of the inflammation through a dehiscence in the facial canal. A case is described in which the paralysis occurred after a fresh attack of catarrhal otitis, and two other cases are mentioned, in the first of which a right-sided and then left-sided paralysis set in. The otitic origin could only be demonstrated for the left side.

BOENNINGHAUS.

b.—CHRONIC SUPPURATIVE OTITIS.

163. MAHU. *The simplest after-treatment in the radical operation.* *Ann. des mal. de l'oreille*, etc., July, 1905.

164. IWANOFF. *Subsequent inflammations in the cavity of the ear left after radical operation.* *A. f. O.*, vol. lxviii., p. 63.

165. KANDER. *The disturbances of the sensation of taste in chronic purulent otitis, especially after operations.* *A. f. O.*, vol. lxviii., p. 69.

166. BOURGUET. *The surgery of the labyrinth.* *Annal. des mal. de l'oreille*, etc., Sept., 1905.

163. MAHU. *The simplest after-treatment in the radical operation.*

Eeman's method of after-treatment without packing and the insufflation of boric acid after the posterior membranous canal wall has been resected, has been simplified by the author by omitting the insufflations of boric acid because this powder in the beginning sometimes pains. Adhesions and incomplete obliterations of the operative cavity are prevented by the use of the curette and cauterization but not always successfully. (This occurs also in the cases which are treated with packing.) The method therefore does not apply to cases of cholesteatoma or tuberculosis. Of four uncompli-

cated cases, two recovered in five weeks, three in eight to ten weeks.

BOENNINGHAUS.

164. IWANOFF. *Subsequent inflammations in the cavity of the ear left after the radical operation.*

In the first of these three cases, one year after the operation a cyst-like tumor developed in the posterior wall of the operative cavity. This contained a tenacious colloid brown mass. Under the microscope there were red blood cells, polynuclear leucocytes, cholesterin crystals, shapeless clumps of albumen. The thin-walled cyst was lined with a stratified pavement epithelium which became horny in the periphery. The origin of this cyst cannot be determined. On the other two sides there were cholesteatomatous tumors which required after-operation. In one, in addition, there was an aspergillus mycosis present.

ZARNIKO.

165. KANDER. *The disturbances of the sensation of taste in chronic purulent otitis, especially after operations.*

After a detailed discussion of the chorda tympani and of the tympanic plexus in their relations to the sensation of taste and touch, fifty personal observations are described which were made in the ear clinic at Freiburg. They were all cases of chronic purulent otitis and cholesteatoma or those which had been operated upon for these troubles.

Four qualities of taste were tested: sour (acetic acid), salty (salt solution), bitter (quinine), sweet (simple syrup). An application was made with these substances to the edge and dorsum of the tongue, in front, in the middle, and at the root; then the soft palate, the palatal arch, and the posterior pharyngeal wall. In some cases the electric current was used, and finally the sensibility for tickling and thermic irritants was examined.

The results are the following: 1. The chorda tympani is the nerve of taste for the anterior two-thirds of the tongue. (This is generally accepted.) 2. The tympanic plexus supplies the posterior third of the tongue, the soft palate, the palatal arch, and the posterior pharyngeal wall. (This is also generally accepted.) 3. Complete destruction of these nerves produces a defect in taste, a lesion or an alteration

in the sensation of taste, or the absence of after-taste. 4. Brücke's theory of the specific energy of the sense organs holds also for the sense of taste. It can be demonstrated in diseases of the tympanum when the nerves of taste are also involved. 5. The chorda tympani is frequently diseased in chronic suppurations of the middle ear. In complete destruction of the chorda there is a distinct destructive process, usually cholesteatoma. Notwithstanding severe diseases in the surrounding parts, the chorda may be preserved or only slightly changed, so that the presence of taste in the terminal area of the chorda does not designate the severity or extent of disease in the middle ear. 6. The tympanic plexus may be more or less injured in purulent otitis. 7. The chorda tympani is always torn in extraction of the hammer and anvil. 8. In the so-called radical operation this nerve is always destroyed. The tympanic plexus is rarely completely destroyed, but generally more or less disturbed. 9. The disturbances of the sensation of taste after the radical operation are constant and irreparable. 10. Subjective sensations of taste and feeling in the tongue after operations depend probably upon irritative conditions of the chorda. 11. The chorda tympani and the tympanic plexus are pure nerves of taste. The occasional diminution of the sensation of touch, in parts where taste has become lost, presumably means that with the sensation of taste there is a delicate perception of tactile and thermic sensations. 12. In the use of the electric current, the reaction of taste is only perceived as sensation of taste where the other reagents are also noted.

ZARNIKO.

166. BOURGUET. *The surgery of the labyrinth.*

A complete study with clear drawings. The opening of the labyrinth from the back (Jansen) is not to be recommended on account of the possible injuries to important structures in the depth, such as the jugular bulb, the superior petrosal sinus, and the facial nerve in the internal auditory meatus. The opening from the outer side (Hinsberg and Botey) is as follows: (a.) Opening of the cupola of the vestibulum, then the beginning of the external and anterior semicircular canals. Whenever the external semicircular canal joins the

vestibule at the inner side (12 per cent.), instead of above the facial nerve, injury to this nerve may occur through a slipping of the burr. It can be avoided by a protector like the one suggested by Stacke, which is placed in the oval window. (b.) Extensive resection of the promontorium. If the carotid is displaced, injury to this structure may be possible, but an opening of the canal is usually heralded by moderate bleeding from the venous carotid plexus.

BOENNINGHAUS,

C.—CEREBRAL COMPLICATIONS.

167. POUTOPPIDAN. Otitic cerebellar abscess and its treatment. *Habilitationsschrift*, Kopenhagen, 1906, p. 200.
168. LANNOIS and PERRETIÈRE. Paralysis of the abducent nerve of otitic origin. *Arch. internat. d'otol.*, etc., vol. xxi., p. 798.
169. HEINE. Prognosis of otitic meningitis. *Berl. kl. W.*, 1906, No. 4.
170. LAVAL. On the operative exposure of the bulb of the jugular vein. *A. f. O.*, vol. lxvii., p. 241.
171. LAURENS. Bulb thrombosis. *Ann. des mal. de l'oreille*, etc., August, 1905.

167. POUTOPPIDAN. *Otitic cerebellar abscess and its treatment.*

This paper is based upon two cases, one operated on with success, the other with autopsy. The author has been able to collect nineteen other cases observed in Denmark. The book is based principally upon the literature extant, though a number of topographic and anatomic studies are described which are of some interest. The chapter on operative treatment is the most important. The author is opposed to Koerner's advice not to enter the cranial cavity at the time of the first operation when the bone next to the dura and the dura are healthy. The bone covering the dura and the dura are frequently perfectly normal in cases of brain abscess as well as in sinus phlebitis and in epidural abscess. If in the course of a middle-ear suppuration there are chills, jumping temperature, or high continuous fever, and when an optic neuritis appears, then at the very first operation the skull must be opened, and, when no distinct diagnosis is present, the posterior cranial cavity must first be explored. The author recommends

the opening of the cerebellum through the mastoid process in front of the transverse sinus. The appearance of the dura and the condition of brain pulsation are not of any value for diagnosis of a brain abscess. JOERGEN MOELLER.

168. LANNOIS and PERRETIÈRE. *Paralysis of the abducent nerve of otitic origin.*

A right-sided chronic purulent otitis in a patient thirteen years of age led to severe headache, fever (38.5°), and a right-sided paralysis of the abducent nerve. The operation disclosed a perisinuous abscess. Gradually the paralysis improved, but after ten weeks it had not completely disappeared. OPPIKOFER.

169. HEINE. *Prognosis of otitic meningitis.*

Heine believes that our conception of purulent meningitis as divided into diffuse and circumscribed should be abandoned. He follows Lexer in distinguishing between circumscribed, acute progressive, and the general form of infection. The latter is to be diagnosticated when the lumbar puncture is not only clouded but directly purulent and contains bacteria. The prognosis of this variety is absolutely bad, but there are unquestionably cases of circumscribed purulent meningitis which have gotten well, and there are probably also some of the acute progressive variety. MUELLER.

170. LAVAL. *On the operative exposure of the bulb of the jugular vein.*

This is a plea for Grunert's operation on the jugular bulb. The method advised by Voss is regarded as being of no advantage but suffers from several distinct disadvantages. The description which the author gives is very thorough and lucid. It is a pity that there are not a few drawings. ZARNIKO.

171. LAURENS. *Bulb thrombosis.*

This is a readable, exhaustive treatment of the subject. Of interest and new is the following: In injecting fluid into the jugular vein in the cadaver, either from above or below, the post-mortem clots which are situated in the cupola of the bulb remain. This goes to show that it is impossible to properly cleanse the bulb without exposure. The author operates

according to Grunert's method, though he endeavors to attack the bulb from a posterior aspect rather than from the side, and does not resect the entire mastoid process but only its posterior half, whereby the facial is more protected. The patient operated upon according to this method was cured.

BOENNINGHAUS.

NERVOUS APPARATUS.

172. PANSE. Twelve temporal bones belonging to seven cases of congenital syphilis. *A. f. O.*, vol. lxviii., p. 31.

173. RHESE. On the involvement of the inner ear after concussion of the head. *Deutsche med. Wochenschr.*, No. 6, 1906.

174. CORNET. Disturbances of equilibrium of labyrinthine origin in the course of malaria. *Arch. internat. d'otol.*, etc., vol. xxi., p. 809.

172. PANSE. *Twelve temporal bones belonging to seven cases of congenital syphilis.*

In three of the temporal bones the author found marked changes in Corti's organ similar to the conditions found in deaf-mutes. In many cases there was enormous hyperæmia and extravasation of blood. In one case there was a perforation of pus through the oval window.

ZARNIKO.

173. RHESE. *On the involvement of the inner ear after concussion of the head.*

The author has carefully examined the ears in 100 persons suffering from an injury to the head, and believes he has discovered a symptom-complex which even after years will give a distinct clue to the preceding injury. These symptoms are: vascularization along the upper wall of the canal, nystagmus, diminution of bone conduction, similarity of the hearing relief on both sides, disturbance of the hearing duration in the middle tones, while the hearing acuity has suffered but little. All patients are excluded who have been troubled with the ear before the traumatism.

NOLTENIUS.

174. CORNET. *Disturbances of equilibrium of labyrinthine origin in the course of malaria.*

This is the case of a soldier who after a severe infection with malaria exhibited pronounced disturbances of equi-

librium. This was apparently due to an affection of the left labyrinth and disappeared on the use of quinine.

OPPIKOFER.

NOSE AND NASO-PHARYNX.

a.—GENERAL.

175. POLYAK. On the use of hyperæmia in diseases of the upper respiratory passages. *Arch. f. Laryngol.*, vol. xviii., book 2.

176. CALAMIDA. Blood pressure in individuals suffering from nasal stenosis. *Arch. internat. d'otol.*, etc., vol. xxi., p. 485.

175. POLYAK. *On the use of hyperæmia in diseases of the upper respiratory passages.*

Fifty-six cases of various affections of the upper respiratory passages were treated with hyperæmia. The congestion seemed to be of value in tuberculosis of the lungs, and the pain on swallowing was very much diminished. These observations do not permit a final opinion as to the value of hyperæmia, though they are in favor of further experiments.

VON EICKEN.

176. CALAMIDA. *Blood pressure in individuals suffering from nasal stenosis.*

The chapter on the pathological physiology of nasal respiration includes the results of the examination of the blood pressure in occluded nasal respiration. For this purpose persons suffering from hypertrophy of the turbinals, polypi, and hypertrophy of the pharynx were made use of. The blood pressure was measured with the apparatus of Riva-Rocci. This measurement gave in most cases of occluded nasal respiration no distinct changes in the blood pressure. In completely occluded noses there was a transient or permanent increase of pressure.

OPPIKOFER.

b.—OZÆNA.

177. PUTSCHKOWSKI. Galvanocautery in ozæna. *Wratschebnaja Gasetta*, 1906, No. 13.

178. DE NAVRATIL. On the value of submucous injection of paraffin in ozæna. *Arch. internat. d'otol.*, etc., vol. xxi., p. 459.

177. PUTSCHKOWSKI. *Galvanocautery in ozæna.*

Three cases are described in which cauterization of the

nasal turbinals gave good results. These results, however, may be explained by the inflammatory reaction after the cauterization and are presumably only temporary.

SACHER.

178. DE NAVRATIL. *On the value of submucous injection of paraffin in ozæna.*

The favorable action of submucous injection of paraffin is based on only five cases. The author uses the instrument recommended by Brockaert and Lermoyez. OPPIKOFER.

C.—TUMORS OF THE NOSE.

179. MAGNUS. *Congenital benign intranasal tumors.* Arch. f. Laryngol., vol. xvii., book 3.

180. TORHORST. *So-called bleeding polypi of the nasal mucous membrane.* Arch. f. Laryngol., vol. xviii., book 2.

181. PEGLER. *Pathology and treatment of bleeding polypi of the septum.* Arch. internat. d'otol., etc., vol. xxi., p. 814.

182. TRAUTMANN. *Carcinoma of the interior of the nose.* Arch. f. Laryngol., vol. xvii., book 3.

179. MAGNUS. *Congenital benign intranasal tumors.*

A review of the cases occurring in literature and report of a single personally observed case. In a boy four months old a fleshy polyp as large as a plum was removed from the nose which was attached to the lower turbinal.

VON EICKEN.

180. TORHORST. *So-called bleeding polypi of the nasal mucous membrane.*

Report of thirteen cases of microscopic examinations and the complete literature.

VON EICKEN.

181. PEGLER. *Pathology and treatment of bleeding polypi of the septum.*

The clinical picture and the pathology of the bleeding septum polyp are given and also the relation between this form of polyp and the malignant new growths is studied.

OPPIKOFER.

182. TRAUTMANN. *Carcinoma of the interior of the nose.*

The tumor, an epithelial carcinoma, developed after injury originating in the sphenoidal sinus, extending into the nasal

cavities and into the naso-pharynx without invading the other accessory cavities.

VON EICKEN.

d.—NASAL SEPTUM.

183. FREER. Submucous window resection of the septum. *Arch. f. Laryngol.*, vol. xviii., book 1.

The attempt of Freer to thoroughly remove all the destroyed parts of the septum is excellent, though his impression that this can be done after Killian's method is erroneous. The reasons which he gives are more theoretic than practical. The submucous resection of the septum is an operation which demands considerable technical skill. Nevertheless the operation can, even in the difficult cases, be performed in twenty minutes, and frequently in a very much shorter time if Killian's suggestions are followed.

VON EICKEN.

e.—DISEASES OF THE ACCESSORY SINUSES.

184. SCHUERCH. The relation of the size of the antrum of Highmore to the individual skull, and its practical importance in the treatment of suppurations of the maxillary antrum. *Archiv f. Laryngol.*, vol. xviii., book 2.

185. MENZEL. Experimental irrigation of the maxillary antrum. *Archiv f. Laryngol.*, vol. xvii., book 3.

186. HAJEK. A study of the path of infection in a rhinogenic-cerebral complication. *Arch. f. Laryngol.*, vol. xviii., book 2.

187. CHAUVÉAU. Traumatic uncomplicated perforation of the maxillary sinus. *Arch. internat. d'otol.*, etc., vol. xxi., p. 541.

188. CHAUVÉAU. Syphilis of the maxillary sinus. *Arch. internat. d'otol.*, etc., vol. xxi., p. 904.

189. SEBILEAU. The Lamorier-Delsault operation formerly and now. *Annal. des mal. de l'or.*, etc., Dec., 1905.

190. OKOUNEFF. Spasms of the upper eyelid; symptoms of an exudative inflammation of the frontal sinus. *Arch. internat. d'otol.*, etc., vol. xxi., p. 796.

191. CAPART. The operative indications in the treatment of sinusitis. *Arch. internat. d'otol.*, etc., vol. xxi., p. 401.

192. GUISEZ. Submucous injection of paraffin after operations for nasal empyema. *Ann. des mal. de l'oreille*, etc., Dec., 1905.

193. HENRICI. On the technique of probing the frontal sinus. *Arch. f. Laryngol.*, vol. xvii., book 3.

194. IWANOW. On the radical operation of the frontal sinus. *Chirurgija*, Oct., 1905.

195. ONODI. Mucocoele of the ethmoidal labyrinth. *Arch. f. Laryngol.*, vol. xvii., book 3.

196. KLEIN. The methods of operating for inflammation of the frontal sinus, with report of 13 cases operated on according to Killian. *Inaug.-Diss.*, Königsberg, 1905.

197. THOMPSON. Two cases of fatal frontal sinusitis. *Ann. des mal. de l'oreille*, etc., Nov., 1905.

198. BENTZEN. A case of rhinogenic pyæmia. *Hospitalstidende*. No. 17, 1906.

199. STOECKEL. Broad endonasal opening of the sphenoidal cavity with the burr. *Arch. f. Laryngol.*, vol. xvii., book 3.

184. SCHUERCH. *The relation of the size of the antrum of Highmore to the individual skull, and its practical importance in the treatment of suppurations of the maxillary antrum.*

Neither the configuration of the entire skull nor that of the face, nor the relative size of the superior maxilla gives us any clue as to the size of the maxillary antrum. The floor of the maxillary cavity is situated low down more frequently in men than in women and is usually associated with large alveolar and palatal depressions. Elevation of the floor of the maxillary cavity is especially frequent in narrow and high palates. The opening of the maxillary antrum from the alveolus and from the lower meatus of the nose may be difficult. The cavity may even be so small that an instrument introduced through the lower meatus may not strike the cavity at all.

VON EICKEN.

185. MENZEL. *Experimental irrigation of the maxillary antrum.*

To determine whether fluid injected into the maxillary antrum can enter the frontal and ethmoidal sinuses experiments were made by the author on cadavers. He found that when the frontal and ethmoidal sinuses were open only a slight pressure was required in order to induce the fluid from the maxillary antrum into these cavities. If, however, they were closed, no fluid entered on the greatest pressure. We, therefore, in the living need not fear in irrigating the maxillary antrum to induce the fluid into the frontal sinus. This would only be possible if the frontal sinus had a communicating fistula or if by an opening in the septum it communicated with the frontal sinus on the opposite side.

VON EICKEN.

186. HAJEK. *A study of the path of infection in a rhinogenic-cerebral complication.*

Hajek describes the various ways in which a cerebral complication occurs after suppuration of the nasal accessory cavities, and gives the exact microscopic analysis of the way in which purulent meningitis followed an endonasal operation. This fatal complication resulted from infection along the blood current. Streptococci were found in the swollen mucous membrane of the ethmoid labyrinth and in its blood-vessels; also in the blood-vessels of the dura which communicated with those of the ethmoid. The bony tissue was normal.

VON EICKEN.

187. CHAUVEAU. *Traumatic uncomplicated perforation of the maxillary sinus.*

Report of a case of penetrating injury of the maxillary sinus. The external wound was situated 2cm below the eye. On closing his mouth and nose the patient was able to expel the air through this opening. The wound healed without producing a suppuration of the cavity.

OPPIKOFER.

188. CHAUVEAU. *Syphilis of the maxillary sinus.*

The patient had suffered from syphilis eight years before, and was not properly treated. He had been suffering from discharge from the left side of his nose for several months. Transillumination showed a disease of the maxillary antrum. All local treatment was abandoned. Treatment by injection with benzoate of mercury produced recovery in two weeks.

OPPIKOFER.

189. SEBILEAU. *The Lamorier-Delsault operation formerly and now.*

This long paper shows that the author endeavors to resect as much as possible of the facial wall in empyema of the maxillary antrum, removes the mucous membrane completely, does not suture, and there is no after-treatment. Apparently this plan always leads to recovery, and, notwithstanding no after-treatment, seems to give better results than the report of the Clinic in Rostock. The author is one of the few French rhinologists who does not follow Luc's operation, with right in the reviewer's experience. He also objects to the division of maxillary suppurations which is now accepted

in France, namely into empyemas (collections of pus of dental origin) and abscesses (true inflammation of the sinus).

BOENNINGHAUS.

190. OKOUNEFF. *Spasms of the upper eyelid; symptoms of an exudative inflammation of the frontal sinus.*

After an attack of influenza there were symptoms of blepharospasm which were limited to the left upper eyelid. After three weeks the trouble disappeared, and the following day a large quantity of clear fluid escaped from the left nose. Unquestionably the blepharospasm was dependent upon the inflammation of the frontal sinus.

OPPIKOFER.

191. CAPART. *The operative indications in the treatment of sinusitis.*

After meeting with a case of osteomyelitis of the cranial bone which developed after a double radical operation of the frontal sinuses, the author believes that we should not be too ready to operate in affections of the accessory cavities, especially not in those cases where the symptoms of the patient are in no relation to the inconvenience and danger of this method of treatment. Moreover, he has found that fatal complications in affections of the accessory cavities only exceptionally are present, and that consecutive endocranial inflammations are rarely amenable to operative treatment.

OPPIKOFER.

192. GUISEZ. *Submucous injection of paraffin after operations for nasal empyema.*

After clearing out the ethmoid labyrinth the nasal passages are dilated. The formation of scabs can be to a certain extent prevented by diminishing the size of the nasal lumen. For this purpose paraffin is injected under the mucous membrane of the floor of the nose and of the septum. There are four cases reported.

BOENNINGHAUS.

193. HENRICI. *On the technique of probing the frontal sinus.*

To probe and irrigate the frontal sinus Henrici recommends probes and cannulæ of a semicircular curve.

VON EICKEN.

194. IWANOW. *On the radical operation of the frontal sinus.*

The demands which we must place on the radical operation for frontal sinus empyema are the following:

1. Good cosmetic result.
2. Favorable conditions for contraction in size of the frontal sinus.
3. Accessibility to the ethmoid labyrinth and a broad communication into the nose.

These demands are all met by Killian's operation. The technique of this operation is carefully described and illustrated by a drawing. The author has operated on three cases.

SACHER.

195. ONODI. *Mucocele of the ethmoidal labyrinth.*

Report of a case of mucocele which had penetrated into the frontal bone and displaced the frontal sinus, as shown by probing and the X-ray picture. The mucocele was opened by endonasal methods and its contents and its wall examined microscopically. Recovery.

VON EICKEN.

196. KLEIN. *The methods of operating for inflammation of the frontal sinus, with report of thirteen cases operated on according to Killian.*

A historic collection of operations for the frontal sinus. The advantages of Killian's operation are not always evident from the case histories. It is of the greatest importance to arrest the suppuration; this is even more important than a favorable cosmetic result. The latter can frequently only be determined a long time after the operation. Shortly after the operation there is but very little deformity after any method of operating.

BRUEHL.

197. THOMPSON. *Two cases of fatal frontal sinusitis.*

Two cases of double pansinusitis of ancient days where the frontal sinus had been operated upon a number of times without attacking the ethmoidal cells, from which evidently the fatal meningitis developed. Nowadays more radical methods of operating would have given better results.

BOENNINGHAUS.

198. BENTZEN. *A case of rhinogenic pyæmia.*

Report of a case presented to the thirty-eighth meeting of the Danish Oto-Laryngological Society.

JOERGEN MOELLER.

199. STOECKEL. *Broad endonasal opening of the sphenoidal cavity with the burr.*

The author recommends a club-shaped burr to open the sphenoidal cavity whose movements can be instantly arrested.

VON EICKEN.

f.—OTHER DISEASES OF THE NOSE.

200. IGNATOWITSCH. *On the treatment of rhinophyma. Ein Fall von Rhinophym-Chirurgia*, Dec., 1905.

201. SILBERSTEIN. *Venous thrombosis after paraffin operations on a saddle nose. Berl. klin. Wochenschr.*, 1906, No. 19, p. 606.

202. BAUROWICZ. *A cyst of the lower turbinal. Arch. f. Laryngol.*, vol. xviii., book 2.

203. HOLLÄNDER. *On the treatment of tuberculosis of the mucous membrane. Berl. klin. Wochenschr.*, 1906, No. 23.

204. PASCH. *On nasal tuberculosis. Arch. f. Laryngol.*, vol. xvii., book 3.

205. MYGIND. *Lupus of the Nose. Arch. f. Laryngol.*, vol. xvii., book 3.

206. SENATOR. *On lupus of the upper respiratory passages. Berl. klin. Wochenschr.*, 1906, No. 23.

207. MEYER. *The nasal treatment of epiphora. Berl. klin. Wochenschr.*, 1906, No. 23.

208. BELLIN and LEROUX. *A case of double-sided membranous atresia of the choanæ. Ann. des mal. de l'oreille, etc.*, Aug., 1905.

209. GELLÉ. *Enlargement of the glands in affections of the nose and of the naso-pharynx. Ann. des mal. de l'oreille, etc.*, July, 1905.

200. IGNATOWITSCH. *On the treatment of rhinophyma.*

In this case of rhinophyma the tumor was removed in slices with a sharp scalpel. This was done at two sittings, at each of which the patient lost a great deal of blood. The cosmetic result was excellent.

SACHER.

201. SILBERSTEIN. *Venous thrombosis after paraffin operations on a saddle nose.*

Directly after the injection of 4½ccm of hard paraffin the left eye became blind, presumably from thrombosis of the ophthalmic vein. The author concludes that from the experience of this case he warns against further paraffin in-

jections. If such accidents occur, we must do away with paraffin operations, as they fulfil only cosmetic indications.

MUELLER.

202. BAUROWICZ. *A cyst of the lower turbinal.*

The cyst was situated in the posterior third of the lower turbinal and discharged pus into the middle meatus. Broad opening and packing were followed by recovery.

VON EICKEN.

203. HOLLÄNDER. *On the treatment of tuberculosis of the mucous membrane.*

Unusual is the author's idea of applying calomel locally and giving iodide of potash internally in order to obtain a more intense local iodine action. The results require to be tested on a larger material.

MUELLER.

204. PASCH. *On nasal tuberculosis.*

Nineteen cases are reported from Brieger's Clinic.

VON EICKEN.

205. MYGIND. *Lupus of the nose.*

This is a report of two hundred patients who were treated in Finsen's Institute on account of lupus of the external skin and were examined by the author for complications on the part of the nose, pharynx, and larynx. One hundred and twenty-nine of these patients presented lupoid changes of the interior of the nose, and more frequently in the female than in the male. In the pharynx and larynx the lupus occurred more frequently in the young than in the adult individuals.

VON EICKEN.

206. SENATOR. *On lupus of the upper respiratory passages.*

The basis of this communication is furnished by thirty-five cases of lupus of the face and mucous membrane observed in Lassar's Clinic.

MUELLER.

207. MEYER. *The nasal treatment of epiphora.*

In cases in which the lachrymation is the result of an abnormal narrowness of the lower meatus, the author has practised breaking the attachments of the lower turbinal rather than a resection. The turbinal is grasped by a flat nasal forceps

and turned to an angle of 30-45 per cent. Results appear in one to two weeks. MUELLER.

208. BELLIN and LEROUX. *A case of double-sided membranous atresia of the choanæ.*

In order to prevent the reclosure of the choanal opening after removal of the septum, the author has devised the original and successful plan of resecting the posterior part of the nasal septum. BOENNINGHAUS.

209. GELLÉ *Enlargement of the glands in affections of the nose and of the naso-pharynx.*

This paper draws attention to the important connection between the glandular swellings of the neck and infections of the nose and naso-pharynx. BOENNINGHAUS.

g.—NASO-PHARYNX.

210. SCHÄIER. *On the selection of children for the summer homes.* *Das rote Kreuz*, 1906 No. 8.

211. FRANK. *Hypertrophy of the pharyngeal tonsils in the old.* *Archiv f. Laryngol.* vol. xviii., book 2.

210. SCHEIER. *On the selection of children for the summer homes.*

Before sending the children off, the adenoid vegetations should be removed. BRUEHL.

211. FRANK. *Hypertrophy of the pharyngeal tonsils in the old.*

The pharyngeal tonsil in the old differs microscopically from that found in the young. There are only a few follicles, while the adenoid tissue and the connective tissue are very much increased. VON EICKEN.

PALATE, PHARYNX, AND MOUTH.

212. MAUGERI. *Papilloma of the uvula and of the soft palate.* *Arch. internat. d'otol.*, etc., vol. xxi., p. 831.

213. BAUROWICZ. *On the diagnosis of pseudo-leucemia.* *Arch. f. Laryngol.*, vol. xii., book 3.

214. PROEBSTING. *A tonsillar clamp.* *Arch. f. Laryngol.*, vol. xviii., book 1.

215. LEVINGER. *Malignant tumors of the tonsil.* *Arch. f. Laryngol.*, vol. xviii., book 1.

216. GAREL and BONNAMOUR. *Intermittent swellings of the salivary glands as signs of salivary stones.* *Ann. des mal. de l'oreille etc.*, Nov., 1905.

212. MAUGERI. *Papilloma of the uvula and of the soft palate.*

The clinical appearance is given of three papillomata, of which two were situated in the palatal arch and one at the tip of the uvula. The microscopic examination is added.

OPPIKOFER.

213. BAUROWICZ. *On the diagnosis of pseudo-leucemia.*

In a man forty-six years of age who had formerly had a tumor of the left tonsil which was regarded as a gumma; later the pharyngeal tonsil became enlarged, then the right palatal tonsil, numerous lymphatic glands, and the spleen. Examination of the blood revealed a condition characteristic of pseudo-leucemia. Death ensued after several months.

VON EICKEN.

214. PROEBSTING. *A tonsillar clamp.*

This instrument can be applied to any position of the tonsils in bleeding after tonsillotomies.

VON EICKEN.

215. LEVINGER. *Malignant tumors of the tonsil.*

A tumor of the right tonsil was removed in a man thirty-two years of age who had had the inguinal glands on the left side removed several weeks previously. The microscopic examination of both specimens gave endothelioma. Then a relapse occurred in the left groin, the mesenteric glands enlarged, producing an intestinal stenosis. Metastatic tumors appeared in the left ilium, the right groin, the right axilla, and the right side of the neck. The right tonsil remained free from relapses. As an autopsy was not performed, it was impossible to decide where the primary site of the tumor had been.

VON EICKEN.

216. GAREL and BONNAMOUR. *Intermittent swellings of the salivary glands as signs of salivary stones.*

Observations of nine cases in which on eating the salivary gland regularly became enlarged, which diminished on pressure with the escape of saliva or spontaneously after a

short time. In six cases the submental, in two the sublingual, and in one case the parotid glands were involved. The retention of saliva seemed to be produced by a salivary calculus whose presence was not always easily determined. This interesting condition is new, and has been given the name of "Intermittent Hernia" of the salivary glands.

BOENNINGHAUS.

